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ABSTRACT

A 3-year research program at the University of Connecticut evaluated the effectiveness of a recently implemented general education curriculum on undergraduates. The research consisted of testing students for performance on locally developed test instruments created for each of six general education areas: (1) Science and Technology, (2) Foreign Languages, (3) Culture and Modern Society, (4) Philosophy and Ethical Analysis, (5) Social Science and Comparative Analysis, and (6) Literature and the Arts. Faculty and students were surveyed to determine their views. Test instruments for each of the six areas were developed by faculty, pilot tested one year and revised the next. Students were tested on the revised instruments during the final project year. The evidence pointed to modest, but clear, positive effects of the general education curriculum most evident in the Foreign Language and Science and Technology areas. Faculty reported strong and consistent support of virtually all goals of general education. Students, especially seniors, reported support for general education but showed dissatisfaction with lack of choice of courses within the curriculum. Extensive appendixes contain general education goal statements; sample procedures; a final testing report; project evaluation details; dissemination information; and summary reports used for dissemination. (JB)

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ED359859

FINAL REPORT

Assessing General Education Outcomes: An Institution-Specific Approach

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Grant Number P116B81881

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EXECUTIVE SUMMARY

Project Title: Assessing General Education Outcomes: An Institution-Specific Approach

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Project Overview

In the Fall of 1987 the University of Connecticut implemented a general education curriculum for undergraduates. In 1988-1989 a three-year research program was undertaken to assess the effect of the curriculum on achievement of the goals on which the general education curriculum was established. The research program consisted of testing students for performance on locally developed test instruments created for each of six general education goal areas: Science and Technology, Foreign Languages, Culture and Modern Society, Philosophy and Ethical Analysis, Social Science and Comparative Analysis, and Literature and the Arts. Faculty were also surveyed to determine their views on the general education requirements. Students were interviewed to obtain their views of general education, the requirements, and the courses available to them.

Test instruments for each of the six areas were developed by faculty during the 1988-89 academic year and pilot tested during the 1989-1990 academic year. Faculty committees revised the test instruments based on the results of the pilot study. Students were tested on the revised instruments during the 1990-1991 academic year. The basic research design and results are outlined below.

Purpose

The primary purpose of this project is program improvement. We set out to measure the success of the general education curriculum in achieving goals, and to use the results to recommend changes in the goals for each of the six general education areas and suggest appropriate adjustments in course content. We also wished to determine student reaction to the general education curriculum and faculty support for the goals of general education.

Background and Origins

In March 1986 the University of Connecticut Faculty Senate established an Ad Hoc Committee for Evaluation of General Education

Curriculum to "evaluate any University-wide curriculum requirements adopted [in 1985-1986]." This project is an outgrowth of the desire of the faculty and the academic administration to determine if the general education curriculum is having a beneficial effect on student learning.

Project Description

Method

Fifty faculty members were selected from a pool of volunteers, and assigned to six different goal area committees, corresponding to the goal areas for the general education curriculum. The six committees reviewed the goals, examined the course syllabi for the courses within each area, reviewed existing standardized and commercial tests which might be applied to the area, and created draft instruments, which were pilot tested during the second year of the project. Sixteen locally-developed instruments and one commercially developed instrument were used in the measurement phase.

1694 incoming freshmen and 601 randomly selected upper division students participated in the study. The upper division sample was representative of the University population by college and by major. Incoming freshman students participated as part of freshmen orientation. Each freshman student completed one of the instruments, and each upper division student completed two of the instruments in a single test session.

Faculty agreement with the goals of the general education curriculum were obtained from 316 faculty members who responded to a mail questionnaire. Student views on general education and the UConn curriculum were obtained from 44 students in a series of focus group interviews. Another 724 students in introductory and selected upper division courses were used to assess students' feelings self-efficacy within each of the general education goals. Students in this study were asked to report, using quantitative scales, how competent they perceived themselves to be on each of the general education goals.

Analysis

To validly test the effectiveness of the general education curriculum it was necessary to include statistical controls for general ability levels, maturation, and overall performance as a student in non-general education courses. Multiple regression models were constructed with SAT scores, semester standing, and grade points in both general education and non-general education courses as predictors of performance on the assessment instruments.

Results

The best predictor of performance on the test forms across all areas was SAT verbal score. The SAT math score did not predict performance. The next best predictors were grade points earned in general education courses and grade points earned in other, non-general education courses. Maturity and other university experiences, as measured by semester standing, were found to have no relationship to performance. In general, upper division students scored significantly higher on test instruments than did freshmen, but much of this difference was due to attrition of students with lower SAT scores. The evidence pointed to modest, but clear, positive effects of the general education curriculum. Curriculum effects were seen most clearly in the Foreign Language and Science and Technology goal areas.

Faculty reported strong and consistent support of virtually all goals of general education.

Students reported support for general education, but also showed some dissatisfaction with lack of choice of courses within the curriculum, and with particular areas of the curriculum, such as mathematics. Seniors generally reported more appreciation of general education than did lower division students.

Students felt relatively confident in their abilities to perform the goals. They felt the most confidence in the Social Sciences area, and least confident in the Philosophy area. In some cases, their perceptions of self-efficacy appeared to decrease over time, particularly in Foreign Languages and Arts and Literature areas. In other cases, self-efficacy increased with time at the university.

Summary and Conclusion

The UConn general education assessment project was successful. The project has received high praise from academic administration. Assessment activities have been institutionalized, and the activities of this project will be continued under the umbrella of a new University level committee. Faculty acceptance of assessment has increased over the duration of the project, although assessment remains a somewhat controversial topic. Student acceptance of assessment was surprisingly high.

The information from this project will be used as input to faculty committees for revision of general education goals, possible curriculum revision, and revision of the assessment instruments. This project is now viewed as a first step in a continuing process, rather than a one-time study.

ASSESSING GENERAL EDUCATION OUTCOMES: AN INSTITUTION-SPECIFIC APPROACH

Project Overview

In the Fall of 1987 the University of Connecticut implemented a general education curriculum for undergraduates. In March 1986, as a response to faculty questions about the effectiveness of the new curriculum, the University of Connecticut Faculty Senate established an Ad Hoc Committee for Evaluation of General Education Curriculum to "evaluate any University-wide curriculum requirements [previously] adopted. " Those tasks were to include:

-- prepare a statement explicitly identifying the goals of any changes made in the requirements and report this to the Senate;

-- identify and evaluate a methodology to evaluate whether these goals are being met, and any other effects they may have, and report these findings to the Senate;

-- apply the methodology to all requirements for determining whether such requirements are to be modified or dropped.

The general education curriculum was created from courses which were either required, or selected from a small number of alternatives, in six goal areas: Science and Technology, Foreign Languages, Culture and Modern Society, Social Science and Comparative Analysis, Philosophy and Ethical Analysis, and Literature and the Arts. The Ad Hoc Committee created, and the Faculty Senate approved, a number of goals for each area. These goals are reproduced in Appendix 1.

In 1988-1989 a three-year research program was undertaken to assess student advancement toward these goals. The research program consisted of several different research projects, which were designed to investigate the following general research questions:

1. Does the level of performance in these general education areas improve with increasing time in the University?

2. Does the number of courses taken in a general education area and performance in those courses predict improved performance in that area?

3. Do the faculty involved in general education courses agree with the goal statements for that area?

4. Do students feel that general education provides them with benefits?

The immediate beneficiaries of this research are the faculty and the academic administration, who need this information for several purposes. First, the extensive curriculum changes needed some justification which was based on research, rather than presumption. These changes were costly, as they involved shifts in teaching time allocations and course offerings within departments. Skeptics of general education questioned the efficacy of the curriculum which was established by the Faculty Senate.

Academic deans and department heads can use the information to improve the general education curriculum. Some evidence of the strength or weakness of goal achievements will guide curriculum and resource allocations. This information may also aid in the creation of new courses which address particular goals, or changes in requirements which may achieve the same goals more efficiently.

The information may also be useful in revising the goals, as we enter the next phase of general education assessment. Some goals are poorly articulated, or are too abstract to guide either curriculum decisions or assessment research. The problems introduced by these goals have been highlighted by the measurement difficulties that they have created.

Ultimately, the consumers of general education, the students, will be served by this research. Improvements in the general education curriculum will result from this research, and this should improve student learning.

This project has produced two short reports which were disseminated to the faculty and academic administration in written form, and in several formal presentations (these are outlined in the Dissemination section). There have also been some organizational changes of note which have resulted partially or wholly from this project:

1. Creation of the University Assessment Committee. This committee of faculty and academic administration is charged with conducting assessment and preparing an annual report for the Connecticut Board of Governors for Higher Education. The activities of this project in assessing general education will be continued by the University Assessment Committee.

2. Continued funding for general education assessment has been obtained from the Provost's Office. This commitment will give long-term stability to the assessment effort.

3. Special faculty committees within selected general education goal areas are being created to convert the results into curriculum recommendations. These committees will work jointly with the Special Assistant to the Provost for Teaching and the University Assessment Committee in modifying or creating courses to address particular goals. They will also review and revise the general education goals.

Purpose

The initial research problem at the outset of this project involved designing a study that could provide valid and reliable answers to a question posed at the faculty senate when the general education curriculum was finally passed. This question was simple and direct: "How will we know it will work?" This question was posed by Barbara Wright, the original UConn project director, in an article with the same title (AAHE Bulletin, pp. 14-17, April, 1990). Dr. Wright asked how could one verify that a menu of nearly 130 courses spanning some 40 departments would indeed "ensure that all undergraduate students ... become verbally and quantitatively articulate; intellectually curious and versatile; acquire critical judgment, moral sensitivity, and working understanding of the processes which they can continue to acquire and use knowledge; develop consciousness of the diversity of human culture and experience, awareness of their era and society in the context of past eras; and an understanding of scientific thought, experimentation and formal hypothesis testing"?.

We must confess that the problem has not been simplified by our research efforts. Rather, the difficult nature of measuring abstract skills and diverse knowledges has been reinforced. But we are now confident that we have the template for approaching the problem which addresses the primary difficulties. In outline form, the process is this:

1. Have faculty define goals as clearly and concretely as possible. This has the salutary side benefit of stimulating faculty discussion about general education, and clarifying the teaching approaches of the individual faculty members involved in the discussion.
2. Allow faculty to determine what constitutes evidence of achievement of the goals.
3. Permit and encourage diverse measurements. The success of a broadly defined curriculum with abstract goals cannot be assessed with a single test instrument.
4. Provide sufficient resources to permit valid testing.
5. Use faculty for project direction and/or oversight.
6. Involve academic administration in the process.
7. Provide assurances to faculty that the process is not going to be used as a tool for merit raises, program elimination, rigid curriculum or course content prescriptions, etc.
8. Treat general education assessment as a continuing process, with continual revision of the goals and testing instruments.

A number of administrative and political issues are implicitly addressed in this outline. We have drawn some conclusions about these issues and the appropriate responses. These conclusions may not apply to all institutions, but we are convinced of their value.

1. General Education Assessment must be seen as a faculty directed activity. At any hint of its use as an administrative device (such as for measuring the "value" of certain courses), faculty support at our institution would not only disappear, but it would be replaced with active opposition. The Faculty Senate has passed explicit resolutions expressing this position.

2. The value of assessment to faculty is in curriculum development and as an aid to teaching. The results of assessment must be linked to these ultimate uses.

3. Notwithstanding (1) and (2), the academic administration must also be involved with general education assessment. The resources and leadership for curriculum improvement must come from this source. Grassroots faculty activity will wither if sufficient encouragement for change is not provided by academic leaders in the administration. And not least of all, the resources to carry out the rather expensive activity of assessment are dispensed by the academic administration.

Background and Origins

At the outset of our assessment project, the University of Connecticut was unlike the smaller institutions which have served as successful assessment models. Unlike these smaller campuses, with a clearly defined teaching mission, we are a large research-oriented state university with approximately 10,000 undergraduate and 5000 graduate students. The research orientation of a university this size usually creates a less than favorable environment for assessment, with undergraduate teaching relegated to a low status. There has traditionally been little monetary or even symbolic reward for addressing problems of student learning, although there are now signs that this situation is improving. It is evident, then, that this long, painstaking and largely successful undertaking required high levels of faculty involvement, enthusiasm and participation. The goal generation and test instrument development phases of the project were strictly faculty controlled endeavors. These tasks produced much debate about the specific goals for achievement required of the undergraduate students. The evaluation project also sparked often heated debates about whether the curriculum should be assessed at all and what, if anything, should be done with the results.

Fortunately, the impetus for this research came from the faculty itself, as a result of the controversial adoption of a general education curriculum. As a university with a research orientation, the faculty was reasonably comfortable with the decision to submit the curriculum to an empirical test.

But there was virtually no institutional structure on which to place this project. The academic administration had no policy or program for assessment. Neither did the Faculty Senate. So the first step was the establishment of the Ad Hoc Committee for Assessment of General Education by the Faculty Senate. This

committee served as the kernel for the project.

FIPSE support was the second crucial element. This gave the assessment efforts an air of legitimacy that was very important. Persons who feared that the assessment would be used for organizational politics were reassured by the oversight and credibility that an external granting agency provided. The funds provided by FIPSE also permitted a project of sufficient scope to be mounted, so that the results could not be attacked as superficial.

Finally, the support of the Provost's Office was critical. This support came at an early stage of the project, but it was probably facilitated by the appearance of the FIPSE grant. The Provost's Office supplied one of the most expensive items of this research: graduate student assistantships. These assistants provided the numerous hours of labor required to test almost 3000 students, handle data analyses, and carry out the dozens of administrative tasks the project required. Significantly, a graduate assistant was also provided as support for the project director's personal research program, which freed some of his time to devote to the project. The understanding of the Provost's Office that involvement in assessment only comes at a personal cost to a faculty member, and that some compensatory actions are necessary, was a significant aspect of this project.

The Provost's support has continued. His office has provided student labor during the summer months when graduate assistantships are not available, office operation money, equipment, and other forms of administrative support. This support is continuing during the current academic year, when no FIPSE funds are available. The General Education Assessment Office is currently staffed with three graduate assistants, and has been provided with a budget for about $8000 in office and research expenses.

Project Description

The first two Research Questions concerned student learning outcomes. They required performance testing of students in each of the six general education goal areas. Research Question 3 involved a survey of faculty views on general education goals, and Research Question 4 was investigated with a series of focus group interviews of students, to determine their views of general education and the UConn curriculum.

The learning outcomes research (Research Questions 1 and 2) proceeded in three stages:

Phase 1 (1987-88): General education area subcommittees were recruited. Fifty faculty members were selected from a pool of volunteers who responded to a University-wide letter, and assigned to six different goal area committees, corresponding to the goal areas for the general education curriculum. The commit-

tees represented a mix of faculty from within the goal area, an "outside" member or two, and a "measurement expert" familiar with educational or behavioral measurement. The committees participated in a series of training programs (described in detail in the Year 1 interim report of this project). These programs were designed to familiarize the faculty with basic educational and behavioral measurement techniques.

The six committees first reviewed the goals, examined the course syllabi for the courses within each area, reviewed existing standardized and commercial tests which might be applied to the area, and considered various types of measurement techniques. Test instruments for each of the six areas were developed by the committees and prepared for pilot testing.

During this phase, 676 general education faculty members were surveyed by campus mail concerning their agreement with the general education goals.

Phase 2 (1988-1989): The instruments developed in Phase 1 were pilot tested on 1148 incoming freshmen during the 1989 summer freshman orientation program, and on 342 advanced (junior and senior) students during the academic year. This was a convenience sample obtained from instructors who volunteered intact classes for testing. Freshmen were obtained from some of the summer orientation sessions. The sample was not representative of the general student population. This data was used to test the reliability of the test items, develop test grading procedures, and develop data handling procedures.

The test instruments were revised by the goal area committees, based on the results of this pilot testing. The details of this pilot testing are contained in the Year 2 interim report to FIPSE.

Student focus group interviews were conducted during this phase of the project. Focus group interviewing was conducted to determine student subjective responses to general education. Forty-four freshmen and seniors from diverse academic departments participated in eight focus group discussions led by student moderators trained in this methodology by a Communication Sciences professor (Dr. Leslie Snyder) who also interpreted the results of the videotaped interviews. Seniors in both Liberal Arts (who had taken a curriculum much like the general education curriculum) and those in the professional schools and colleges (who had entered before the general education requirements took effect, and had not taken courses in most of the required areas) were recruited. Students openly discussed their impressions of general education and their experiences with the general education course requirements.

Students' perceptions of their own abilities in the areas articulated by the goal statements were measured using six self-efficacy tests developed by Dr. Steven Owen (Educational Psychology).

from the goal statements in each of the six areas. Students were asked to self-assess their competence in performing each of the goals, using a five-point scale (5= Quite a Lot of Competence, 1= Very Little Competence).

Data were collected from 724 students recruited from several different large introductory level undergraduate courses and some upper-division courses. This was a convenience sample, so its representativeness cannot be assumed. However, the courses chosen were primarily university-wide introductory courses which draw students with a wide diversity of majors and interests. The upper-division courses were chosen from several departments.

Phase 3 (1990-1991): This phase of the project included testing 1694 incoming freshman during the 1990 summer freshman orientation program. This represented a near census of all the incoming freshmen, and so can be considered representative of students entering the University. Students at each test session, held during an orientation period, were asked about their foreign language background. A quota of students were then given the foreign language general education instruments for languages they had taken in high school. All other students received one test randomly selected from one of the other five areas. No student refused to participate.

A sample of 1,412 upper division students was drawn from the student records database. Of this sample, 299 students could not be contacted because they had left the university, or failed to answer their telephones after 3-5 callback attempts, or failed to respond to 3 or more messages left on answering machines or with roommates. An additional 80 were not contacted, as their academic majors exceeded the quotas for their category. The quotas were based on university percentages, obtained from the Office for Institutional Research. There were an additional 244 students who had received initial contact letters, but were not scheduled for testing sessions when the testing program was completed.

The actively recruited sample of 789 was first contacted by mail and then with follow-up telephone calls in a tightly controlled recruiting procedure (details of this procedure are contained in Appendix 3). Of these students, 93 (11.8%) refused to participate and 95 (12%), were scheduled, but failed to attend their test session. A total of 601 (76%) of the recruited sample of advanced students were tested. This sample is representative of the university population by school and major (see Appendix 2). With a few exceptions, each student took two tests from different areas in a single testing procedure. Students were paid $15.00 for their participation.

Project Results

The faculty committees in the different goal areas independently concluded that commercially available test instruments were not

sufficiently sensitive to the UConn general education goals and curriculum. The committees produced 17 test forms for use in the six goal areas. Only one of these forms was a commercially available standardized test (The Cornell Z test of critical thinking, specified by the Philosophy and Ethical Analysis committee). The initial test instruments were reviewed by local and off-campus experts, as described in the Year 1 interim report. These reviews were used by the committees to do an initial revision of the instruments.

During the second phase of the project, the instruments were pilot tested on a large number of students. This data yielded extensive information about individual items on each instrument. Statistical analyses which included the predictive validity of each item, the grading reliability for open-ended items, student responses to the test instruments, etc. were provided to the committees. This information produced shortened test instruments in some cases, as poor items were dropped. It also produced substitution of items with poor discrimination ability, many revisions of question wordings, changes in the instructions to students, and extensive changes in the grading protocols for essay-type questions.

The final instruments were used in the year-long Phase 3 testing. The detailed results of this testing are contained in Appendix 4. A summary of the results is presented here.

Differences Between Freshmen and Upper Division Students

Upper division students had significantly higher high school SAT Verbal (503 vs. 472) and SAT Math (556 vs. 537) scores. This indicates selective attrition during the freshman or Sophomore year of students who had lower math and verbal abilities when they entered the University. All simple comparisons of freshmen and upper division student performance will include the effect of this attrition, unless statistical controls are used.

Averaging across all general education areas, upper division students scored significantly higher than did freshmen (Overall mean = 53% for upper division students versus 45% for freshmen). This difference includes effects of attrition of poorer students, growing maturity, general curriculum effects, as well as the effects of the general education curriculum.

The better performance of upper division students appeared in all general education areas except Philosophy and Ethical Analysis, and a majority of the goals in each area showed significant improvements.

Research Question 1 is answered in this analysis: students do improve with increasing time at the university. But since some of this improvement is apparently due to attrition, Research Question 2, which concerns the effect of the general education curriculum, becomes very important.

Effects of the Total General Education Curriculum

The first step in a more detailed examination of the effects of the General Education curriculum is to separate the effects of students' initial abilities, selective attrition, maturity, and performance in non-General Education courses from the General Education curriculum effects. To do this, simultaneous regression models, which include statistical controls for each of these factors, were constructed (see the tables in Appendix 4). In these models, the effects of each of the individual factors are separated from the effects of the other factors, so we can see the independent effects of each factor, with the influence of all other factors removed. The dependent variable in these models was the standard score for the General Education Assessment Instrument, computed using the overall mean and standard deviation for that instrument.

Across all general education areas, for all students (freshmen and upper division) the best predictor of performance (beta = .27) was the SAT Verbal score. The SAT Math score did not predict overall performance, but was a predictor in the area of Science and Technology, and for some particular goals in other areas. The large effect of verbal abilities may reflect the fact that many of the general education test instruments required high levels of verbal processing. It might also indicate that general verbal abilities are critical to performance of the tasks associated with general education outcomes.

The second best predictors were the grade points earned in all areas of the general education curriculum (beta = .11) and the grade points earned in non-general education course (beta = .11). This is clear evidence for the positive association of the General Education curriculum with performance on the assessment instruments, independent of students' SAT score differences, selective attrition, differences in general maturity, and performance in other parts of the curriculum.

The relationship of non-general education courses and performance on the assessment instruments indicates that performance in courses outside the general education curriculum may potentially affect student performance on the assessment instruments, even when initial abilities, maturity, and general education curriculum effects are held constant. This may simply indicate that better students do better on tests (an obvious, but comforting, finding) or that a university education is not neatly partitioned into "general education" and "other education" categories.

No effects of maturity or university experience, as indicated by semester standing, were detected. But this finding does indicate that the curriculum effects seen above are unlikely to be simple maturation effects.

From this evidence, we conclude that the general education curriculum, considered as a whole, has a modest but definitely positive effect on student performance on the locally-developed instruments. This is the essential answer to Research Question 2.

Research Question 3 concerned faculty views on the goals of general education. Forty-seven percent (316) of the faculty responded to the goal statement questionnaire. Response rates for each general education area were:

Foreign Language	25 of 60	42%
Arts and Literature	42 of 105	41%
Philosophy and Ethical Analysis	32 of 58	55%
Social Sciences	94 of 221	42%
Culture and Modern Society		
Western Culture	20 of 51	39%
NonWestern Culture	25 of 37	68%
Science and Technology	78 of 144	54%

Each goal was evaluated by faculty in the same general education area. The faculty responses are outlined in detail in the reports submitted with the Year 2 interim report. The responses showed very strong and consistent agreement on the basic goals of general education. With very few exceptions, respondents checked "Agree" or "Strongly Agree" when asked if they agreed or disagreed with the general education goal. The goals were very noncontroversial, even though the means of implementing them and of assessing success in meeting them did produce some disagreement within the faculty.

Research Question 4 was addressed with a series of focus group interviews. A full report on these interviews was included in the Year 2 interim report. In the interviews, students generally accepted the idea of the general education requirements. None of the students advocated their abolition. Students recognized that the goals of the general education requirements are to give them a broad education. Some freshmen and a few upper division students, though, perceived the requirements as a burden that had to be shouldered if they wished to graduate. More positively, many seniors reported that they changed their perspective over time, coming to value what they previously endured.

A common student criterion for evaluating the worth of a general education area was its potential application to future work. This opinion was held, despite the acceptance of the idea that the general education requirement is meant to broaden students' interests and knowledge. Thus, students seem conflicted between the desire for a liberal education and for one that is specialized and directed toward vocational ends. A sort of compromise view was that the general education courses can help students decide their major, but once they have chosen a major, they should not be required to take additional general education

courses.

At many points in the conversations, students had a hard time separating the concept of general education from the execution of particular courses. When they showed resentment of taking a course in a category they did not value, they tended to choose the course with the reputation of being easiest, but then focused on the fact that they did not think they learned anything. Cheating, foreign teaching assistants with English language problems, and very large lecture sections, while they are attributes of particular courses, were associated with their opinion of the requirements as a whole.

Overall, the abstract principle of general education was accepted. However, there was much discussion over the value and execution of specific courses in each goal area. In general, skills courses, such as writing and languages, were appreciated. Mathematics was the exception, suffering from a common view that some people cannot handle mathematics, and that the courses are poorly taught. None of the students mentioned the general principles and problem solving procedures that can be learned in math courses. Instead, math skills beyond balancing a checkbook were seen as irrelevant for those in non-technical fields.

Among the other categories, the social sciences and history seemed to be accepted as worthwhile by nearly everyone. In these categories, students wanted more choice of courses, or courses that were taught in a better manner.

There was much more debate about science and literature and art. Both categories were labeled by some students as irrelevant, but both also had their advocates. Some seniors regretted not paying more attention during these courses, or not having taken them if they were not required. The seniors expressing the latter sentiment seemed more intellectually curious, and to have an overall appreciation for a broad education, whereas the former admitted to being recent converts to the idea of valuing knowledge for knowledge's sake.

Suggestions about the selection and execution of the courses included: a computer course requirement, improving the English-speaking abilities of foreign teaching assistants, and providing more sections of writing courses. Some of these suggestions have already been implemented or are being addressed by the faculty and administration.

Finally, the change of heart expressed by many seniors suggests that there may be an opportunity for seniors to try to create a more receptive attitude toward the general education requirements among incoming freshmen. One way which they might achieve this is through peer counseling at orientation, when freshmen are choosing their courses.

Research Question 4 was also addressed in a survey which assessed students' feelings of competency in the areas of general education. Students felt relatively confident in their abilities to perform the goals. They felt the most confidence in the Social Sciences area, and least confident in the Philosophy area. In some cases, their perceptions of self-efficacy appeared to decrease over time, particularly in Foreign Languages and Arts and Literature areas. (Interestingly, performance on some areas of the assessment instruments in these areas also appears to decrease over time). In other cases, self-efficacy increased with time at the university.

Two broad conclusions may be drawn from these findings. First, students have generally positive views of their skills in the individual areas. In the social cognitive view, the findings suggest that students are likely to approach that content after graduation from the university, rather than avoid it in the future. Second, the goal statements showing the lowest self-efficacy scores need careful analysis to investigate several alternate explanations for the lower scores. For example, lower scores may indicate that these goal statements reflect higher expectations or more complex behaviors; lower scores may imply that the curriculum addressing those goals need adjustment; or respondents may not understand the meaning of those goal statements, so lower scores reflect more confusion than accurate self-appraisal.

Evaluation

A summary of the findings for the final stage of data collection for this project has been distributed to general education evaluation committee members, heads of departments represented in the general education curriculum and other relevant university personnel. We will obtain feedback from them during a series of individual meetings to be held in December, 1991 and February 1992, and consequently cannot report on their evaluation of the project at this time. However, there are several other sources of project evaluation which will be summarized here.

Academic Administration.

As part of the dissemination of this project, a formal presentation outlining the project and its most important results was made to the Dean's Council. This is a periodic meeting of the Provost, the Associate Provosts, Deans of all Schools and Colleges within the University, and Heads of organizational units involved with the academic program of the University, such as International Affairs and Student Services.

Verbal feedback during this presentation was very favorable to the project. The assessment project was praised by the Provost as an example of important and high quality research which could be obtained at low cost by enlisting the aid of committed facul-

ty. Members of the Dean's Council supplied many questions which they urged the project director to consider in future assessment research. The interest in the research by one of its prime audiences, and the presumption that such assessment research will continue are perhaps the best indications of the success of the project.

More formal evaluation was sought of members of the Dean's Council. Three days after the presentation, all members were mailed the questionnaire reproduced in Appendix 5. As only one week has passed since this mailing, returns are incomplete. However, the results of the preliminary returns (listed in Appendix 5) are very positive.

Probably the best evidence of a positive evaluation of the project from the academic administration is the decision to continue funding assessment for the medium-term future. The Provost's Office has given relatively strong assurances that assessment in general education (as well as expanded assessment efforts in other areas) will be continued for at least the next three years. This assurance is in the form of a tentative commitment to fund at least two graduate assistantships to assist the University Assessment Committee, and the miscellaneous expenses of the assessment office maintained by the committee.

Faculty support for continuation of the General Education Assessment Project was voiced in the November, 1991 meeting of the Faculty Senate. At the meeting, the following resolutions were passed:

"The University Assessment Committee should continue to conduct assessment of the general education curriculum, revising instruments as necessary, and report annually to the Senate Curriculum and Courses Committee on such assessment."

"The Senate AdHoc Committee for Evaluation of the General Education Curriculum should be discharged; pending and subsequent issues of assessment of general education should be managed by the University Assessment Committee with reports to the Senate Curriculum and Courses Committee."

General Education Test Instrument Evaluations.

Evaluation of one major product of the project, the UConn General Education Assessment Instruments, was requested of two groups: faculty who are familiar with both the curriculum in one of the general education areas and with the instruments themselves; and from students who took the test instruments. Results of these evaluations are presented fully in Appendix 6.

Faculty Evaluation. These evaluations are really a simple follow-up review, similar to those conducted in Phase 1 by outside reviewers. However, this review was conducted by faculty members and graduate teaching assistants who were more familiar with the

UConn curriculum, and who were familiar enough with the assessment instruments to make very perceptive judgments.

Faculty reviewers were moderately positive in their evaluation of the instruments, but they commented on a number of deficiencies. Overall, enthusiasm by the reviewers for the success of the instruments in tapping the essence of student performance in the goal areas could only be characterized as lukewarm. The reviewers clearly felt that the instruments need some revision. The project staff concurs with that judgment.

Student Evaluation. Students were asked for comments about the test that they had taken at the completion of their test sessions. These comments were content analyzed to determine if there were consistent problems with any of the test instruments. The tabulation of student comments is in Appendix 6.

There were some consistencies in student comments, but the percentage of students who made identical comments was small. Interestingly, some of the test forms produced comments which were positive. For example, the most frequent comment about the Social Sciences instruments was that they were "interesting." In fact, one student commented that he/she "wish(ed) the courses were as interesting as the test."

Overall, the most frequent negative comment was that the tests were "difficult or complicated". This comment does not appear to point out a deficiency in instruments which were deliberately designed to be challenging. Considering the evaluations across all general education goal areas, about 10% of the students made positive comments, while 11% made negative comments of one sort or another, a remarkably good balance.

Some test forms were reported to pose time problems for about one-third of the students. These problems were discussed with the committees which created the instruments. Generally, the committees concluded that the ability to read, analyze, and complete the test instruments within a constrained time was part of the demonstration of competence by the student. Since almost one-third of the students also reported that they had sufficient time to complete the instruments, we concluded that the test forms were of the proper length.

Continuation and Dissemination.

The activities of the General Education Assessment Project have been assimilated into the University Committee on Assessment. This committee has been charged by the Provost with coordinating a range of assessment activities conducted by different divisions of the University.

The University Committee on Assessment has prepared a 5-year plan for institutional assessment, and filed the plan with the Con-

necticut Board of Governors for Higher Education. This plan lists General Education Assessment as one of six major areas of activity to be pursued over the next five years. The general education assessment activities outlined in that plan are based on the continuation of the FIPSE-funded project. The institutional assessment plan was reviewed by a panel of academic staff and faculty from Connecticut colleges and universities, and by the Board of Governors staff. The General Education component of the plan was singled out for praise in this review.

The test instruments developed during the current project will be the starting point for a new round of test revision. The results of this project will provide action information to a new general education subcommittee, which will review the goals of general education and make recommendations for revision and improvement in assessment test instruments and procedures.

The continuation of this project is being funded currently by the Provost's Office. During this academic year, the project staff will be preparing and delivering presentations outlining the results of the project to various interested parties. Already, during the Fall semester, presentations have been given to the full University Senate and to the University Dean's Council. The latter group is chaired by the Provost, and is made up of the deans of all the university colleges and schools and directors of the student service divisions.

During the course of the project, two short interim reports were prepared. These were distributed to faculty involved in general education, the deans of all colleges and schools, and to other persons who inquired about the project. Copies of these reports are included in Appendix 9.

Two University-wide presentations of the interim results were made in October 1989 and October 1990. All Deans, academic department heads, and faculty involved with project were urged to attend these presentations, and the attendance at both included many influential members of the faculty and academic management.

There have been 48 requests from other colleges and universities for the summary reports and/or copies of the assessment instruments. These requests are summarized in Appendix 7. Some of these results were generated from presentations given by the UConn project staff and associated faculty members at the 1990 and 1991 AAHE Assessment Forum conferences. These presentations served to distribute information about the UConn project beyond the boundaries of the university.

Locally, news of the project has been carried in the UConn Advance (the faculty and staff weekly newspaper), The Daily Campus (the student daily newspaper). In addition, the project has received requests to prepare summary articles for Assessment Update, the Journal of General Education, and IE Focus Newsletter. Project staff will prepare and submit these articles during

the next several months.

Summary and Conclusions

The UConn general education assessment project was successful. The research questions were answered with data in which most persons can place confidence. The results described in this report must still be considered preliminary, as the faculty has not had time to digest and discuss their implications.

One of the most salutary effects of this project has been to stimulate faculty discussion of general education goals and curricula across disciplinary boundaries. We expect that the coming months will produce more of this discussion as the results of this study are directly addressed by university faculty. The faculty has not been unanimous in its support of general education assessment (or general education itself, for that matter). The wariness and skepticism about assessment and its uses has decreased among faculty during this project. The Faculty Senate has passed a resolution encouraging continuation of the project, with a mechanism for periodic reporting of findings to that body. We count this faculty acceptance of the assessment process as another beneficial outcome of the project.

The project has received high praise from academic administration. Assessment activities have been institutionalized and funded, and the activities of this project will be continued under the umbrella of a new University level committee.

The information from this project will be used as input to faculty committees for revision of general education goals, possible curriculum revision, and revision of the assessment instruments. This project will serve as a first step in a continuing process, rather than a one-time study.

The view that assessment is a continuous process, and that its results should affect curriculum revision, teaching, and goal setting is now approaching the status of conventional wisdom, even on this research-oriented campus. However, our next challenge is to convert this view to relevant action. We intend to use the general education assessment project as a foundation to address directly the issues of teaching and learning in general education.

APPENDIX 1

GENERAL EDUCATION GOAL AREA STATEMENTS

Foreign Languages

1. Know the basic grammatical structures of the target language and use the essentials of the language's sound system in speaking and listening.

2. Acquire an active vocabulary of approximately 1,500 lexical units and passive recognition of approximately 3,000 more.

3. Achieve balanced development of speaking, listening, reading and writing skills at the novice level ("novice" level means ability to communicate on simple, concrete topics and includes a high frequency of grammatical and semantic inaccuracies).

4. In the classic languages, develop reading and writing skills.

5. Learn how the languages may be of future or recreational use.

6. Understand the relationship between language and culture.

7. Acquire an inclusive perspective on the target culture, one which ranges from artistic accomplishments to details of everyday life.

8. Understand the concept of ethnocentrism and be able to identify its impact on the student's views and behavior.

9. Appreciate the contributions of women to the target culture.

10. Appreciate the contributions of minority or marginal populations to the target culture.

11. Understand the value system and characteristic sociopolitical institutions of the target culture which may be based, for example, on race, class, gender, ethnic origin or religion.

12. Understand the interaction between the foreign culture and the student's own in such areas as literature, art, music, philosophy, history and the sciences.

13. Demonstrate awareness of the intellectual training provided by the learning of a foreign language above and beyond the language's practical usefulness.

Literature and the Arts

1. Demonstrate visual and aural concentration as well as ability to assimilate information through a variety of artistic media.

2. Demonstrate capacity for critical thinking and analysis in the visual arts (i.e., explore interdependence of content and configuration) as well as in literature, drama, and music (i.e., explore the interrelationship of content, form and style).

3. Demonstrate mastery of a restricted and coherent body of material, as well as an awareness of broader applications of the methodology.

4. Recognize social, religious, cultural, economic and other values expressed in literature and art.

5. Understand the relationship between an accepted canon and anti-canonical values both in art and society.

6. Understand how literary and artistic criticism have changed over time, and how these changes have been related to social, political, philosophical and other changes.

7. Demonstrate a conceptual basis in literature and the arts that provides entry into the discipline.

8. Demonstrate the rudiments of a specialized vocabulary that will enable the student to move from description to analysis and to articulate critical judgments.

9. Be familiar with representative works by women authors and artists.

10. Be familiar with representative works by Black, Hispanic, Asian and other racial/ethnic authors and artists.

11. Be familiar with a variety of non-western as well as western art forms.

12. Demonstrate sensitivity to the differing expressive potential of forms and words as vehicles for communication.

13. View literature and the arts as integral to all human life and society, and not merely as the special interest of artists of an elite few.

Culture and Modern Society

1. Understand the nature of civilization and its development, in particular the place of the arts, music and literature, engineering and other applied sciences, and agriculture, commerce and other means of subsistence within the general framework of civilization.

2. Identify the key social institutions of a culture, and describe how they fit within the framework of the total sociocultural system. Key social institutions are: economics and social class; friendship; marriage, family and kinship; governance and social control; religion, world view and aesthetics.

3. Have an inclusive perspective on the cultures and societies studied, recognizing not only accomplishments of elites but the skills and contributions of all classes and social groups.

4. Identify aspects of contemporary American civilization whose origins are traceable to the civilizations of the Ancient world, the Middle Ages, and Modern Europe and those drawn from other civilizations (Native American, African, Asian etc.)

5. Develop an appreciation of cultures other than one's own and recognize the impact of ethnocentrism.

6. Understand the contributions of all classes, gender, racial, ethnic, and social groups to the change and persistence of social and cultural norms over time.

7. Describe the contributions of all classes, gender, racial, ethnic, and social groups to the historical development of the arts, sciences, and/or the professions.

8. Understand the dynamics of the relationship between a culture and its physical environment.

9. Identify and compare specific institutions and aspects of Euro-american civilization that are historically distinctive and some that are held in common with other civilizations.

10. Identify the historical origins of the conditions which prevail among non Euro-american civilizations and among non-dominant groups within contemporary civilization.

11. Compare specific characteristics (e.g., professions, institutions) of Euro-american societies with those same characteristics in other societies.

12. Understand that similarities among cultures can make solutions to some pressing human problems possible and illustrate how differences between cultures may make universal solutions to some human problems impossible.

Philosophy and Ethical Analysis

1. Know the significant ideas and debates in philosophy through an analysis of the works of important philosophers.

2. Understand how arguments are constructed and how they may be evaluated.

3. Be familiar with the role of analysis in the formulation, clarification, and acceptance or rejection of a thesis.

4. Express and defend theses relevant to philosophical issues.

5. Analyze fundamental ethical concepts such as "good", "right", "duty", "moral responsibility", and "blame".

6. Identify ethical dimensions of human choice, in contrast to practical, technological, legal, empirical and other dimensions.

7. Analyze fundamental epistemological concepts such as "knowledge", "evidence", "defensibility", "introduction", and "verification".

8. Have a grasp of logic, deduction, validity, proof, and fallacies.

9. Examine in detail one or more contemporary issues concerning justice, gender, self, language, human relations, discrimination, sciences, reality, professional obligations, and religious beliefs.

10. Learn the role general philosophical principles play in the examination of contemporary issues.

11. Have a grasp of the various ways in which logic, ethical, predictive, explanatory, and other kinds of propositions can be supported.

Social Science and Comparative Analysis

1. Understand how relationships (economic, political, social, spatial) develop, persist, and change between individuals and groups or between societies.

2. Differentiate patterns and structures of social systems and institutions.

3. Identify the impact of various social institutions and practices groups in society; e.g., women, minorities, the poor.

4. Have a basic understanding of how to think analytically, and recognize abstract patterns.

5. Have a basic understanding of how to recognize propositions of a theory which are empirically verifiable.

6. Have a basic understanding of how to identify the criteria for empirically testing hypotheses derived from social science theories.

7. Understand the limits of generalizability for specific findings.

8. Understand how individuals are socialized as members of groups and societies; i.e., families, informal groups, organizations, cultures.

9. Understand the ways in which individuals, both alone and collectively, change the groups and societies in which they live.

10. Identify and critique myths and stereotypes about human nature; e.g., class differences, male/female differences, racial differences.

11. Evaluate Western social science theories and perspectives about human behavior through comparative analysis.

12. Recognize how social science knowledge can assist in understanding social issues (e.g. racism, poverty) and human interaction patterns (e.g. childrearing, male-female relations).

13. Recognize the permeating role of political and economic systems in society.

Science and Technology

1. Distinguish facts from interpretation.

2. Describe the scientific method, including the criteria for verification and falsification of scientific ideas.

3. Describe the limitations of the scientific method in developing and expanding knowledge.

4. Understand how imperfections in theory influence generalization and interpretation of scientific ideas.

5. Describe the importance and limitations of model building in scientific inquiry.

6. Comprehend and express information (including numeric and graphic material) related to scientific and technological aspects of a culture.

7. Understand the importance of quantification and statistical analysis in describing events and in making generalization and predictions about those events.

8. Demonstrate an understanding that science is a continuous process; i.e., knowledge succeeds from the past, and will be revised in the future.

9. Acquire a basic knowledge of at least one scientific or engineering discipline.

10. Distinguish concepts derived from scientific and unscientific means.

11. Evaluate the opinions of technological experts in public forms.

12. Merge scientific or engineering data with political, economic, ecological, social, and ethical issues to define and debate problem solutions.

13. Consider the appropriateness of scientific values (e.g., objectivity) in making social and ethical decisions.

14. Appreciate that science and technology involve many disciplines and be conversant with information characteristics of more than one of these disciplines.

15. Describe the differences and relationships between basic science information and its technological implications.

APPENDIX 2

SAMPLE PROCEDURES AND COMPOSITION

The advanced student testing was completed during the Fall 1990 and Spring 1991 semesters. The sample was drawn in two phases.

The first phase was the sample for the Fall upper division testing. This sample was drawn from the Fall 1990 frozen student register file. This file contained students enrolled and in the register for the first week of classes. Two separate samples were drawn for the Fall testing. The first sample was based on a quota system for foreign languages. Students with a minimum of three years of high school or two years of university courses in German, French, or Spanish were randomly selected. One of the goals of the project to test an equal number of students in each of the three foreign languages, so it was necessary to oversample German students, since fewer students take German than either French or Spanish.

A second sample was generated from students with less than three years of High School French, German or Spanish. This ensured a better representation of students who obtained all their foreign language background at the college level.

The second phase of sample generation included three separate samples drawn from the frozen student register files at the start of the Spring 1991 semester. All three samples were randomly generated, with no language quotas. As consecutive samples were pulled, they were matched to the previous ones in order to eliminate the possibility of duplicating previously selected names.

The final sample composition was adjusted by applying sample quotas to the results of earlier testing, so that sample percentages within colleges and majors were very similar to the university population. Eighty students in the sample were not scheduled for testing, as they represented academic majors whose quota had been fulfilled. As the following table shows, the sample makeup was very representative of the undergraduate population.

TABLE A4.1.

Distribution of Students By College and Major

	Sample %	UConn %
AGRICULTURE&NATURAL RESOURCES		
Agriculture&Natural Resources	.0	.0
Ag.Economics & Rural sociology	.0	.1
Agricultural Engineering	.0	.0
Animal Science	.8	.9
Landscape Architecture	.0	.5
Nutritional Sciences	.2	.5
Pathobiology	.7	.3
Plant Science		
Agronomy	.0	.1
Horticulture	.3	.2
Renewable Natural Resources	.5	.6
Total Ag.&Natural Res.	2.5	3.3
ALLIED HEALTH		
Clinical Dietetics	.0	.3
Medical Lab Sciences		
Cytogenetics	.0	.0
Cytotechnology	.2	.0
Medical Technology	.2	.0
Physical Therapy	.8	1.8
Total Allied Health	1.2	2.4
BUSINESS ADMINISTRATION		
Accounting	3.7	4.4
Business, General	.7	.8
Health Systems management	1.0	.7
Finance	3.7	3.4
Real Estate & Urban Economics	.0	.2
Risk & Insurance	.2	.1
Management & Infor Systems	1.0	.6
Management & Organization	1.8	1.0
Marketing	2.3	2.2
Total business Admin	14.4	13.3

	Sample %	UConn %
EDUCATION		
Curriculum & Instruction		
Elementary Education	3.2	1.2
Secondary Education	.0	1.2
Educational Leadership	.0	.0
Educational Psychology		
Rehabilitation	.2	.2
Special Education	.0	.4
Sport & Leisure Studies		
Recreational Services	.2	.3
Sport & Leisure Studies	.5	1.0
Total Education	4.3	4.5
ENGINEERING		
Chemical Engineering	.0	.6
Civil Engineering	1.3	1.8
Computer Science & Eng.	1.3	1.4
Electrical Engineering	2.3	3.2
Mechanical Engineering	2.3	2.6
Total Engineering	7.2	9.7
FAMILY STUDIES		
Design & Resources Management	.7	.9
Human Development & Family Rl.	5.7	4.3
Total Family Studies	6.4	5.2
FINE ARTS		
Art		
Ceramics	.0	.0
Graphic Design	1.3	1.8
Painting	.2	.2
Photography	.2	.3
Printmaking	.0	.0
Sculpture	.0	.1
sub-total	1.7	2.4
Dramatic Arts		
Acting	.3	.3
Direction	.0	.0
Drama, General Program	.2	.1
Puppetry	.0	.0
Technical Design	.0	.2
sub-total	.5	.6

Music		
Applied	.0	.3
Composition	.2	.0
Education (FA)	.7	.1
Music, General	.3	.1
Music Theory	.0	.0
sub-total	1.2	.5
Total Fine Arts	3.4	3.6
GENERAL STUDIES		
Individualized Majors	1.8	.1
LIBERAL ARTS & SCIENCES		
Anthropology	.2	.7
Art History	.5	.2
Biological Sciences	4.5	3.7
Chemistry	1.0	.7
Communication Sciences	3.3	4.9
Economics	5.8	7.5
English	9.0	7.5
Geography	.5	.5
Geology/Geophysics	.2	.2
History	3.3	2.7
Individualized Major	1.8	1.3
Journalism	.7	1.0

APPENDIX 3

STUDENT RECRUITMENT AND RECORDS-KEEPING PROCEDURES

Students were sent an introductory letter which explained the project and asked for their participation. It was explained that participation would require approximately two hours and included taking two 40-minute tests developed by faculty members to test skills in general education areas. Students were told that their participation was voluntary and that the results would not affect their GPA, class standing or become part of their student record in any form. Students were also informed that they would receive $15.00 for their time.

To encourage positive and quick responses, each student also received a return-addressed reservation request form which allowed them to select one of many sessions scheduled at different times of day and days of the week, and to mail it in for processing. For their convenience they were also informed that they could telephone the General Education Assessment Office to ask questions or to enroll in a test session.

Letters were sent in two phases. Since sampling was completed early in the semester, not all student records had updated local student addresses. If this was the case, letters were sent to the student at his or her permanent address. Each envelope contained a "Dated Material - Please Forward" stamp to encourage parents to forward the letter to the students. This procedure took more time, so letters to students who had no local address listed were mailed first. Students with local addresses were sent the letters after the initial mailing to those students who had only permanent addresses available.

Follow-up telephone calls to each student were conducted by staff members. Calling was completed at various times during the day and evenings to maximize the chance of catching students at home. Attempts were made to contact students with no local telephone numbers first. Parents were contacted and asked to provide us with the student's local telephone number. Responses were generally positive, especially when parents were told that students would be paid for their time. Very few parents either "did not know" or would not provide the student's local number.

Students on campus were easily reached by telephone. Each dorm room has a private telephone line and most had an answering machine on which messages were left encouraging the students to participate in the project.

Control sheets were created by the computer program which selected the random sample. Each student had a control sheet (see the example at the end of this Appendix) to allow easy tracking of students in the selection and contact process. Each sheet contained the student's name, social security number, local and

permanent addresses, telephone numbers, semester standing, academic major and how many years of foreign language the student had taken at the high school level. Each sheet also contained an area for recording notes from students and parents, including change of addresses, telephone numbers or student status. A coding system was developed for keeping records of the outcome of each telephone contact attempt (e.g. busy signals, no answer, left message on machine, left message with roommate). This allowed for efficient control of all communication with each student and for more accurate management of the sample. When students were scheduled for a test session, this was noted on the control sheet.

A database program was written to produce weekly progress summaries. Information from the control sheets was entered into the computer data base. The weekly reports summarized the number of students enrolled in each test session, the number who needed follow-up calls, the refusal rate, etc. The paper control sheets were filed away as a backup in case of computer failure.

All registered students received a confirmation notice by mail about one week before the test date, specifying testing date, time and location of their test session. In some cases, reservations were made just a few days to a week prior to a scheduled session. In these instances, students were telephoned on the day before the session to remind them of the session. Only 12% of the students failed to appear at their designated session. An attempt was made to encourage students from the Fall semester who did not appear for their scheduled test session to participate in Spring testing. They were sent a letter asking them to reschedule for a Spring session. Some of the students responded positively. However, many had gone off-campus or had graduated during the previous semester. Some did not respond at all.

Each upper division student completed two 40 minute tests in a single testing session, and filled out a voucher form, for later payment by university check.

Feedback from recruiting procedure

Feedback from students was generally favorable. Few students responded that they were not interested. Most of the students who refused to participate did so because of scheduling conflicts with classes or part-time jobs.

We were curious about feedback from students after our initial telephone contacts with roommates or answering machines. Specifically, we were concerned that important information might not be relayed to the student selected for the sample. One student who we tried to reach a few times by telephone stopped by the office to register for a session. After he left we found a slip of paper on the floor on which his roommate had left him the following note: "Jeff, Nancy Menelly from the UCONN General Education Office called. She wants to know if you want to participate in

a Special Project (THEY PAY) Call her ASAP". This particular roommate very effectively passed on the relevant information, and we believe that this was generally the case.

There were some roommates who volunteered to participate instead of, or in addition to, the student randomly selected. We also received calls from other students who were not part of the sample but who had heard about it and who expressed an interest in participating. We explained to them that only students randomly selected could participate and thanked them for their interest.

STORRS UPPER DIVISION STUDENTS REGISTERED FOR FALL 1990 AS OF 1ST WEEK
SAMPLE INCLUDES SUBSET WITH THREE OR MORE YEARS HS GERMAN, FRENCH OR SPANISH
GENDATE=10/23/90 - FOCEXEC = GENED6 - FILES=NEWREG (TIME-FRAME=1) STUBIO FEMALE

NAME	SSN	HS GERM	HS FREN	HS SPAN	MAJ	DIV SEM	UCONN PHONE	STD PHONE	PARENT PHONE	DORM	ROOM	STUD STREET	CITY STATE	
			4		COMS	03								11510

___1 THURSDAY 11/8 4:00 TO 6:00 BEACH 443

___2 MONDAY 11/12 4:00 TO 6:00 ARJONA 211

___3 TUESDAY 11/13 6:30 TO 8:30 ARJONA 105

___4 THURSDAY 11/15 6:30 TO 8:30 BEACH 443

___5 MONDAY 11/19 6:30 TO 8:30 ARJONA 105

___6 WEDNESDAY 11/21 6:30 TO 8:30 BEACH 317

___7 THURSDAY 11/22 4:00 TO 6:00 ARJONA 215

CALL 1) CODE ____ DATE ____/____/____ TIME ____:____ INIT ____

CALL 2) CODE ____ DATE ____/____/____ TIME ____:____ INIT ____

CALL 3) CODE ____ DATE ____/____/____ TIME ____:____ INIT ____

CALL 4) CODE ____ DATE ____/____/____ TIME ____:____ INIT ____

CALL 5) CODE ____ DATE ____/____/____ TIME ____:____ INIT ____

NEW CONTACT ADDRESS

_____

_____

_____

_____

NEW CONTACT PHONE-> _____

NOT INTERESTED IN PARTICIPATING ____

APPENDIX 4

FINAL REPORT OF PHASE THREE TESTING OF GENERAL EDUCATION STUDENT ATTAINMENT IN GOAL AREAS

PHASE 3 TESTING: ANALYSIS AND CONCLUSIONS

Data was obtained for 1694 freshmen and 601 upper division students. Several analyses were conducted on the data collected.

In the first set of analyses, the total test scores of all students were pooled and analyzed without regard to the individual goal areas. Included in this analysis was a comparison of upper division students' test scores to those of freshmen, as well as a regression to determine the factors associated with overall test scores.

In the second set of analyses, each of the six general education areas was considered individually. A series of regressions were run to determine the factors associated with students' total test scores in each of the six areas.

In a more targeted analysis, test scores on sets of items corresponding to particular goals were used as criteria in an examination of factors that were associated with students' performance on individual goals.

A parallel set of analyses were conducted using only the scores of upper division students.

It must be noted that not all of the goals established were actually tested. For instance, the Foreign Languages and Literature and the Arts instruments did not test for students' abilities on several of the goals. The exclusion of these goals from the assessment tests was a decision made by faculty members who were involved in the composition of test instruments. In addition, Science and Technology goals were categorized into four groups, and students performance on items corresponding to these groups of goals were assessed.

I. OVERALL TEST SCORE RESULTS

Freshmen vs. Upper Division Scores

The total test scores of upper division students were compared with those of freshmen by a paired t-test, the results of which revealed that upper division students scored significantly higher, overall, on the test instruments than did freshmen ($p < .001$). The mean score for upper division students on the test instruments was 53 out of 100 possible points (sd = 19) and for freshmen was 45 out 100 (sd = 18).

This pattern of significant differences between freshmen and upper division students held across all the goal areas, with the exception of Philosophy and Ethical Analysis. The items associated with the majority of the goals in each goal area also showed significant differences (see Table 4.1).

Table 4.1.

Comparison of Freshmen and Upper Division Scores in General Education Goal Areas

GEN. ED. AREA	Fresh-men	Upper Div.	% Goals with Im-prove-ment
Science and Technology	42%	53%	100%
Philosophy and Ethical Analysis	47%	51%[1]	64%
Social Science and Comparative Analysis	56%	71%	92%
Foreign Languages	46%	51%	63%
Culture and Modern Society	28%	31%	50%
Literature and the Arts	50%	62%	100%

[1]Difference is not statistically significant.
All other differences are significant at $p < .05$.

To help explain the differences in test scores between freshmen and upper division students, the SAT scores of upper division students were compared with those of freshmen to determine whether students' initial abilities upon entering the university (which presumably either persist, or are the basis for better or worse use of college courses) influenced scores on the test instruments (see Table 4.2). A t-test of the difference in SAT verbal scores between freshmen and upper division students revealed that upper division had significantly higher SAT verbal scores than did freshmen ($p < .001$). A similar test revealed that upper division students also scored significantly better on the math portion of the SAT ($p < .001$). These results suggest that an attrition effect exists. Students who had achieved upper division status had scored higher on SATs than did new freshmen, and their overall test scores on the instruments will probably reflect their better verbal and quantitative abilities.

Table 4.2.

Comparison of freshmen and upper division SAT verbal and math scores

	SAT Verbal score		SAT Math Score		
	Mean	Standard Deviation	Mean	Standard Deviation	N
Freshmen	472	110	537	123	1645
Upper Division	503	82	556	91	1088
Significance of t-test	$p < .001$		$p < .001$		

Since the objective of this research project was to determine the effects of the general education curriculum on test scores, SAT scores, as well as other variables, were used as statistical controls in subsequent analyses in order to avoid confounding the effects of attrition with curriculum effects. This control essentially removes the effect of differences in initial abilities among students (as measured by the SAT's) and thus removes the effect of attrition of students with poorer initial abilities.

Predictors of Total Test Score Pooled Across Areas

To determine the factors that predicted the performance scores across all goal areas, total test scores for upper division and freshmen in all areas were regressed on the following independent variables: SAT verbal score, SAT math score, years of high school foreign language, semester standing, grade points earned in quantitative (Q) courses, grade points earned in writing (W) courses, grade points earned in general education courses (GenEd), and grade points earned in other (Other) courses (see Table 4.2). The effects of each of these independent variables are described while holding constant ("controlling" or "partialling") the effects of all other independent variables.

As Table 4.3 shows, SAT verbal score had the strongest relationship with total test score ($b = .27$, $p < .01$). Grade points earned in quantitative courses was also significantly associated with total test score ($b = .08$, $p < .01$), as was general education curriculum grade points ($b = .11$, $p < .05$) and grade points earned in non-general education courses ($b = .11$, $p < .05$). These results imply that students with better verbal abilities on entry to the University scored more highly on the assessment instruments. But independent of this effect (and selective attrition), as the grade points earned in general education courses by a student increase, so does his or her score on the general education instruments.

Table 4.3.

Regression results: Total test scores and area test scores

FRESHMEN AND UPPER DIVISION STUDENTS
(N = 2864)

Dependent variable Test scores on:	SAT Verbal	SAT Math	H.S. F.L.	Sem. Stding	Area GPts	Writ Gpts	Quant. Gpts	Other GenEd	Other non-Gened
ALL TESTS COMBINED	.27**	.02	.01	-.01	NA	.02	.08**	.11*	.11*
Foreign Languages	.09	-.09	.44**	-.18	.18**	.04	.03	.34*	.24
Literature and the Arts	.32**	-.05	NA	.01	.04	.05	.03	.06	.17
Culture and Modern Society	.36**	-.04	NA	-.06	.08	-.02	.07	.11	-.07
Philosophy and Ethical Analysis	.34**	.00	NA	-.09	.02	.04	.08	.04	.12
Social Science and Comparative Analysis	.41**	-.02	NA	.41*	.03	.00	.06	.07	-.14
Science and Technology	.07	.21**	NA	.01	.14*	-.01	.12*	.00	.17

Note:
* $p < .05$
** $p < .01$
NA = the variable was not included in the analysis.

A similar analysis was conducted on the overall test scores of upper division students only. This analysis looks only at students who have reached Junior or Senior status, and thus doubly controls for the effects of attrition. The results of this regression (see Table 4.4) reveal that grade points earned in general education courses was still a significant predictor of test score ($b = .07$, $p < .05$). That is, the more grade points earned in general education courses, the better upper division students scored overall. SAT verbal ($b = .26$, $p < .01$) and SAT math scores ($b = .12$, $p < .01$), high school foreign language ($b = .06$, $p < .05$), and grade points earned in non-general education courses ($b = .11$, $p < .05$) also significantly positively influenced total test scores. Even this very stringent test of the general education curriculum, which essentially removes differences in initial abilities in math and language, as well as college Q and W course performance, and likewise sets high school foreign language performance equal for all students, and even equates the performance of all students in non-general education courses (essentially making all students equally good performers in non-general education courses), <u>still</u> finds a weak, but significant effect of the general education curriculum.

Table 4.4.

Regression results: Total test scores and area test scores

UPPER DIVISION STUDENTS ONLY
(N = 1170)

Dependent variable Test scores on:	SAT Verbal	SAT Math	H.S. F.L.	Sem. Stding	Area GPts	Writ Gpts	Quant. Gpts	Other GenEd	Other non-Gened
ALL TESTS COMBINED	.26**	.12**	.06*	-.10	NA	.03	.04	.07*	.11*
Foreign Languages	.14	-.02	.05	-.35*	.24**	.04	-.03	.19	.39*
Literature and the Arts	.22*	.05	NA	-.31*	.08	.06	-.07	.07	.28*
Culture and Modern Society	.37**	-.01	NA	.09	.08	.09	-.03	.06	-.10
Philosophy and Ethical Analysis	.29**	.18*	NA	-.10	.01	.04	.06	-.02	.08
Social Science and Comparative Analysis	.40**	.18*	NA	.02	.05	-.01	-.01	.07	-.04
Science and Technology	.13	.32**	NA	.01	.15	-.01	.09	-.07	.06

Note:
* $p < .05$
** $p < .01$
NA = the variable was not included in the analysis.

II. INDIVIDUAL GOAL AREA RESULTS

1. Foreign Languages

Factors associated with overall performance

To determine the factors associated with test scores of those students who took the foreign languages test, the total foreign language test score was regressed on SAT verbal, SAT math, years of high school foreign language, semester standing, grade points earned in quantitative courses, grade points earned in writing courses, grade points earned in foreign language courses, grade points earned in other general education courses, and grade points earned in all other non-general education courses. The results of this regression can be found in Table 4.3.

High school foreign language experience significantly influenced total foreign language test score ($b = .44$, $p < .01$), as did grade points earned in college level foreign language courses ($b = .18$, $p < .01$). Grade points earned in other general education courses also affected total foreign language test scores ($b = .34$, $p < .05$). No other independent variables were significantly related to overall scores on this test.

A similar regression was run using only upper division students foreign language test scores as the dependent variable (see Table 4.4). Grade points earned in foreign language courses and semester standing were both significant predictors of total foreign language test score ($p < .01$ and $p < .05$, respectively).

The coefficient of the semester standing variable was negative and strong ($b = -.33$), implying that as semester standing increases, total foreign language score decreases. Complementing this finding, high school foreign language experience was not a significant predictor of upper division students' foreign language test scores ($b = .05$). These findings together imply that as students gain experience at the university (as semester standing increases), they may be forgetting what they learned in high school (scores decrease), but that what they learn in college-level foreign language courses helps them on the test. Grade points earned in non-general education courses was also significantly related to test scores in this area ($b = .39$, $p < .05$), indicating that better students, independently of semester standing, and of their performance in language classes, performed better on these instruments.

Factors associated with performance on individual goal items

Next, the items corresponding to the goals of the Foreign Languages curriculum were considered individually. Two sets of analyses were conducted on the individual goals; one considered both upper division students and freshmen; the other included

only upper division students.

The analysis of all students (both freshmen and upper division) revealed that for five of the eight goals assessed, high school foreign language experience had a significant positive effect on goal scores (see Table 4.5 for regression results for individual foreign language goals).

SAT verbal scores were significant predictors of performance of students' abilities to understand the relationship between language and culture (Goal 6; $b = .16$, $p < .05$) and to acquire an inclusive perspective on the target culture (Goal 7; $b = .15$, $p < .05$). Grade points in non-general education courses were significant predictors of students' abilities to acquire an active vocabulary (Goal 2; $b = .29$, $p < .05$) and to achieve balanced development of speaking, listening, reading, and writing skills (Goal 3; $b = .29$, $p < .05$).

When only upper division students were included in the analysis, the independent variables explained less of the variance in individual goal scores. Grade points earned in foreign language courses were associated significantly with students' abilities to achieve a balanced development of speaking, listening, reading and writing skills (Goal 3, $b = .20$, $p < .05$); to acquire an inclusive perspective on the target culture (Goal 7; $b = .21$, $p < .05$); and the ability to understand the concept of ethnocentrism, but were not significant for any other goal item. Grade points earned in non-general education courses were also significantly associated with upper division students' performance on items corresponding to their acquisition of active foreign language vocabulary and recognition of foreign words ($p < .05$, Goal 2). All other independent variables failed to explain a significant amount of the variance in individual goal test scores.

Table 4.5.

Regression results: Foreign Languages Goal Items

FRESHMEN AND UPPER DIVISION
(N = 490)

	SAT Verbal	SAT Math	H.S. F.L.	Sem. Stding	F.L. GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
1.Know the basic grammatical structures of the target language and use the essentials of the language's sound system in speaking and listening.	.06	-.11	.37**	-.16	.08	.29*	.25
2.Acquire an active vocabulary of approximately 1,500 lexical units and passive recognition of approximately 3,000 more.	.11	-.11	.36**	-.247	.13*	.29*	.29*
3.Achieve balanced development of speaking, listening, reading and writing skills at the novice level ("novice" level means ability to communicate on simple, concrete topics and includes a high frequency of grammatical and semantic inaccuracies).	.07	-.09	.46**	-.23	.16**	.36**	.29*
4.In the classic languages, develop reading writing skills.	--	--	--	--	--	--	--
5.Learn how the languages may be of future or recreational use.	--	--	--	--	--	--	--
6.Understand the relationship between language and culture.	.16*	-.09	.15*	.41	.09	-.05	-.18
7.Acquire an inclusive perspective on the target culture, one which ranges from artistic accomplishments to details of everyday life.	.15*	-.07	.17*	.02	.13*	.25	.06
8.Understand the concept of ethnocentrism and be able to identify its impact on the student's views and behavior.	.11	-.01	.07	-.02	.12*	.24	.01

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	SAT Verbal	SAT Math	H.S. F.L.	Sem. Stding	F.L. GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
9.Appreciate the contributions of women to the target culture.	--	--	--	--	--	--	--
10.Appreciate the contributions of minority or marginal populations to the target culture.	--	--	--	--	--	--	--
11.Understand the value system and characteristic socio-political institutions of the target culture which may be based, for example, on race, class, gender, ethnic origin or religion.	.04	-.01	.05	-.22	.08	.32*	.10
12.Understand the interaction between the foreign culture and the student's own in such areas as literature, art, music, philosophy, history and the sciences.	.10	-.03	.07	.00	.11*	.26	-.03
13.Demonstrate awareness of the intellectual training provided by the learning of a foreign language above and beyond the language's practical usefulness.	--	--	--	--	--	--	--

All values listed are standardized regression coefficients.

(*) represents statistical significance at less than .05.
(**) represents statistical significance at less than .01.

UPPER DIVISION STUDENTS ONLY
(N = 150)

	SAT Verbal	SAT Math	H.S. F.L.	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
1.Know the basic grammatical structures of the target language and use the essentials of the language's sound system in speaking and listening.	.03	.02	.02	-.14	.07	.13	.20
2.Acquire an active vocabulary of approximately 1,500 lexical units and passive recognition of approximately 3,000 more.	.16	-.06	.05	-.26	.16	.15	.34*
3.Achieve balanced development of speaking, listening, reading and writing skills at the novice level ("novice" level means ability to communicate on simple, concrete topics and includes a high frequency of grammatical and semantic inaccuracies).	.14	-.01	.04	-.26	.20*	.17	.32
4.In the classic languages, develop reading writing skills.	--	--	--	--	--	--	--
5.Learn how the languages may be of future or recreational use.	--	--	--	--	--	--	--
6.Understand the relationship between language and culture.	.07	-.07	-.04	.05	.00	-.08	-.06
7.Acquire an inclusive perspective on the target culture, one which ranges from artistic accomplishments to details of everyday life.	.12	-.03	.03	-.30	.21*	.12	.23
8.Understand the concept of ethnocentrism and be able to identify its impact on the student's views and behavior.	.11	-.04	.07	-.26	.21*	.14	.18
9.Appreciate the contributions of women to the target culture.	--	--	--	--	--	--	--
10.Appreciate the contributions of minority or marginal populations to the target culture.	--	--	--	--	--	--	--

	SAT Verbal	SAT Math	H.S. F.L.	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
11.Understand the value system and characteristic socio-political institutions of the target culture which may be based, for example, on race, class, gender, ethnic origin or religion.	.00	.03	.05	-.18	.12	.15	.15
12.Understand the interaction between the foreign culture and the student's own in such areas as literature, art, music, philosophy, history and the sciences.	.08	-.06	.05	-.26	.20*	.18	.17
13.Demonstrate awareness of the intellectual training provided by the learning of a foreign language above and beyond the language's practical usefulness.	--	--	--	--	--	--	--

2. Literature and the Arts

Factors associated with overall performance

To determine the factors associated with test scores of those students who took the Literature and the Arts test, total Literature and the Arts test scores were regressed on SAT verbal, SAT math, semester standing, grade points earned in quantitative courses, grade points earned in writing courses, grade points earned in literature and arts courses, grade points earned in other general education courses, and grade points earned in all other non-general education courses. The results of this regression can be found in Table 4.3. SAT verbal score was the only significant predictor of overall Literature and the Arts test score ($b = .32$, $p < .01$). Its positive beta weight implies that as SAT verbal scores increase, total test scores on Literature and the Arts instruments increase.

When upper division students are considered alone (see Table 4.4), SAT verbal also positively influenced Literature and the Arts test scores ($b = .22$, $p < .05$). Semester standing and grade points earned in non-general education courses also influenced test scores in this area. The regression coefficients suggest that as grade points earned in non-general education courses increase, test scores in Literature and the Arts increase ($b = .28$, $p < .05$). However, as semester standing increases, test scores decrease ($b = -.31$, $p < .05$).

Like foreign languages, apparently abilities in this goal area are subject to some forgetting or attrition due to the passage of time.

The dominance of verbal abilities in both the full sample and the upper division sample may be due to the nature of the test, which relied on essay-type responses. But it also may be due to the nature of the material, particularly for literature-related items.

Factors associated with performance on individual goal items

The SAT verbal score is significantly related to all of the seven goals for Literature and the Arts, when freshmen and upper division students are considered together. No other variables are significantly related to goal scores in this area. Likewise, SAT verbal scores are important indicators of assessment instrument scores when upper division students are considered alone (see Table 4.6). This variable is significant for five of the seven goals for this group. In addition to SAT verbal scores, grade points earned in non-general education courses are associated with students' abilities to demonstrate the rudiments of a specialized vocabulary (Goal 8; $b = .21$, $p < .01$) and to demonstrate sensitivity to the differing expressive potential of forms and words as vehicles for communication (Goal 12; $b = .29$, $p < .05$).

Semester standing appears to affect scores on Goal 12 in a negative way. That is, as semester standing increases, students abilities to demonstrate sensitivity to the differing expressive potential of words decreases ($b = -.33$, $p < .05$).

Table 4.6

Regression Results: Literature and the Arts Goal Items

FRESHMEN AND UPPER DIVISION
(N = 360)

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
1.Demonstrate visual and aural concentration as well as ability to assimilate information through a variety of artistic media.	.28**	-.02	.28	.01	.00	-.03
2.Demonstrate capacity for critical thinking and analysis in the visual arts (i.e.explore interdependence of content and configuration) as well as in literature, drama, and music (i.e. explore the interrelationship of content, form and style).	.30*	-.03	.18	.00	.03	.09
3.Demonstrate mastery of a restricted and coherent body of material, as well as an awareness of broader applications of the methodology.	--	--	--	--	--	--
4.Recognize social,religious,cultural, economic and other values expressed in literature and art.	.24**	-.01	.13	.04	.04	.11
5.Understand the relationship between an accepted canon and anticanonical values both in art and society.	--	--	--	--	--	--
6.Understand how literary and artistic criticism have changed over time, and how these changes have been related to social, political, philosophical and other changes.	--	--	--	--	--	--
7.Demonstrate a conceptual basis in literature and the arts that provides entry into the discipline.	.27**	-.03	.27	.01	-.01	-.02

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	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
8.Demonstrate the rudiments of a specialized vocabulary that will enable the student to move from description to analysis and to articulate critical judgments.	.29**	-.10	.02	.04	.01	.26
9.Be familiar with representative works by women authors and artists.	--	--	--	--	--	--
10.Be familiar with representative works by Black,Hispanic, Asian and other racial/ethnic authors and artists.	--	--	--	--	--	--
11.Be familiar with a variety of non-western as well as western art forms.	--	--	--	--	--	--
12.Demonstrate sensitivity to the differing expressive potential of forms and words as vehicles for communication.	.19**	.01	-.10	.07	.12	.18
13.View literature and the arts as integral to all human life and society, and not merely as the special interest of artists of an elite few.	.28**	-.09	.08	.14	.01	.01

UPPER DIVISION STUDENTS ONLY
(N = 202)

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
1.Demonstrate visual and aural concentration as well as ability to assimilate information through a variety of artistic media.	.21*	.02	-.02	.05	.00	-.03
2.Demonstrate capacity for critical thinking and analysis in the visual arts (i.e.explore interdependence of content and configuration) as well as in literature, drama, and music (i.e. explore the interrelationship of content, form and style).	.25**	.03	-.21	.01	-.02	.21
3.Demonstrate mastery of a restricted and coherent body of material, as well as an awareness of broader applications of the methodology.	--	--	--	--	--	--
4.Recognize social,religious,cultural, economic and other values expressed in literature and art.	.15	.07	-.28	.05	-.01	.24
5.Understand the relationship between an accepted canon and anti-canonical values both in art and society.	--	--	--	--	--	--
6.Understand how literary and artistic criticism have changed over time, and how these changes have been related to social, political, philosophical and other changes.	--	--	--	--	--	--
7.Demonstrate a conceptual basis in literature and the arts that provides entry into the discipline.	.19*	.02	-.06	.04	.00	.04
8.Demonstrate the rudiments of a specialized vocabulary that will enable the student to move from description to analysis and to articulate critical judgments.	.21*	-.03	-.14	.08	.00	.27*
9.Be familiar with representative works by women authors and artists.	--	--	--	--	--	--

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
10.Be familiar with representative works by Black,Hispanic, Asian and other racial/ethnic authors and artists.	--	--	--	--	--	--
11.Be familiar with a variety of non-western as well as western art forms.	--	--	--	--	--	--
12.Demonstrate sensitivity to the differing expressive potential of forms and words as vehicles for communication.	.06	.09	-.33*	.11	.08	.29*
13.View literature and the arts as integral to all human life and society, and not merely as the special interest of artists of an elite few.	.18*	-.04	-.20	.14	-.02	.12

3. Culture and Modern Society

Factors associated with overall performance

To determine the factors associated with test scores of all students who took the Culture and Modern Society test, total Culture and Modern Society test scores were regressed on SAT verbal, SAT math, semester standing, grade points earned in quantitative courses, grade points earned in writing courses, grade points earned in culture and modern society courses, grade points earned in other general education courses, and grade points earned in all other non-general education courses. The results of this regression can be found in Table 4.3. As was the case in the Literature and the Arts category, SAT verbal score was the only significant variable explaining variations in overall Culture and Modern Society test scores ($b = .36$, $p < .01$). The coefficient provides evidence of the positive relationship between SAT verbal scores and test scores in this area. When upper division students are considered alone, the same results prevail (see Table 4.4). SAT verbal is the only significant predictor of Culture and Modern Society test scores ($p < .01$) and the relationship between these two constructs is a positive one ($b = .37$).

As this test form required a large amount of reading and used essay responses as the dominant form of measurement, general verbal abilities are apparently the major student performance being measured. Curriculum effects may be present, but if they are, they are too small to be seen independently of the effect of general verbal abilities.

Factors influencing performance on individual goal items

When both freshmen and upper division students are pooled together, SAT verbal proved to be a significant explanatory variable for scores on eleven of the twelve Culture and Modern Society goals (see Table 4.7). SAT verbal does not appear to be significantly related to scores on items corresponding to students' abilities to identify aspects of contemporary American civilization whose origins are traceable to the civilizations of the Ancient world (Goal 4; $b = .11$). Grade points earned in Culture and Modern Society have a significant positive influence on students' perspectives on the cultures and societies studied (Goal 3; $b = .19$, $p < .01$), but the curriculum variable fails to be a significant predictor of performance on any of the remaining goals of this area. No other variables contribute significantly to explaining variance in test scores on any of the twelve goal items when both freshmen and upper division students are considered together.

Similar results are found when the goal item scores of upper division students are considered alone. SAT verbal score remains

the most influential variable affecting test scores on individual goal items; this variable is significant for ten of the twelve goals. Again, scores on items corresponding to Goal 4 appear to be unassociated with SAT verbal score ($b = .01$), as are scores on items measuring students' abilities to describe the contributions of all classes, gender, racial, ethnic, and social groups to the historical development of the arts, science, and/or the professions (Goal 7; $b = .11$). Grade points in Culture and Modern Society courses are a significant predictor of scores on the Goal 11 item only. This goal measures students' abilities to compare specific characteristics of Euro-american societies with characteristics in other societies ($b = .18$, $p < .05$).

Table 4.7.

Regression Results: Culture and Modern Society Goal Items

FRESHMEN AND UPPER DIVISION
(N = 407)

	SAT Verbal	SAT Math	Sem. Stdng	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
1.Understand the nature of civilization and its development, in particular the place of the arts, music and literature, engineering and other applied sciences, and agriculture, commerce and other means of subsistence within the general framework of civilization.	.29**	-.05	-.05	.05	.19	-.10
2.Identify the key social institutions of a culture, and describe how they fit within the framework of the total sociocultural system. Key social institutions are: economics and social class; friendship; marriage, family and kinship; governance and social control; religion, world view and aesthetics.	.32**	-.06	-.10	.13	.22	-.05
3.Have an inclusive perspective on the cultures and societies studied, recognizing not only accomplishments of elites but the skills and contributions of all classes and social groups.	.38**	-.07	-.36	.19*	.09	.14
4.Identify aspects of contemporary American civilization whose origins are traceable to the civilizations of the Ancient world, the Middle Ages, and Modern Europe and those drawn from other civilizations (Native American, African, Asian etc.)	.11	.07	-.24	-.01	.07	.01
5.Develop an appreciation of cultures other than own and recognize the impact of ethnocentrism.	.23**	-.01	.16	.03	.03	-.13
6.Understand the contributions of all classes, gender racial, ethnic, and social groups to the change an persistence of social and cultural	.34**	-.03	-.34	.08	.16	.12

norms over time.

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
7.Describe the contributions of all classes, gender, racial, ethnic, and social groups to the historical development of the arts, sciences, and/or the professions.	.21**	-.03	-.23	.05	.15	-.06
8.Understand the dynamics of the relationship between a culture and its physical environment.	.23**	-.01	-.01	.03	.10	-.16
9.Identify and compare specific institutions and a of Euro-american civilization that are historically distinctive and some that are held in common with civilizations.	.28**	-.05	.01	.04	.18	-.07
10.Identify the historical origins of the conditions which prevail among non Euro-american civilization and among non-dominant groups within contemporary civilization.	.36**	-.04	-.13	.06	.19	-.06
11.Compare specific characteristics (e.g., professions, institutions) of Euro-american societies with those same characteristics in other societies.	.34**	-.07	-.07	.18	.02	.08
12.Understand that similarities among cultures can make solutions to some pressing human problems possible and illustrate how differences between cultures may make universal solutions to some human problems possible.	.36**	-.05	-.14	.07	.13	-.03

UPPER DIVISION STUDENTS ONLY
(N = 199)

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
1.Understand the nature of civilization and its development, in particular the place of the arts, music and literature, engineering and other applied sciences, and agriculture, commerce and other means of subsistence within the general framework of civilization.	.28**	-.01	.02	.04	.10	-.10
2.Identify the key social institutions of a culture, and describe how they fit within the framework of the total sociocultural system. Key social institutions are: economics and social class; friendship; marriage, family and kinship; governance and social control; religion, world view and aesthetics.	.29**	.01	-.05	.11	.11	-.05
3.Have an inclusive perspective on the cultures and societies studied, recognizing not only accomplishments of elites but the skills and contributions of all classes and social groups.	.35**	.02	.02	.13	.01	.03
4.Identify aspects of contemporary American civilization whose origins are traceable to the civilizations of the Ancient world, the Middle Ages, and Modern Europe and those drawn from other civilizations (Native American, African, Asian etc.)	.01	.12	-.14	.08	.06	.01
5.Develop an appreciation of cultures other than own and recognize the impact of ethnocentrism.	.25**	.08	.13	.00	-.03	-.15
6.Understand the contributions of all classes, gender racial, ethnic, and social groups to the change an persistence of social and cultural norms over time.	.34**	.02	-.04	.08	.09	.05

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
7.Describe the contributions of all classes, gender, racial, ethnic, and social groups to the historical development of the arts, sciences, and/or the professions.	.11	.00	-.07	.14	.12	-.05
8.Understand the dynamics of the relationship between a culture and its physical environment.	.27**	-.04	.21	.01	.03	-.17
9.Identify and compare specific institutions and a of Euro-american civilization that are historically distinctive and some that are held in common with civilizations.	.19*	-.03	.13	-.05	.01	-.06
10.Identify the historical origins of the conditions which prevail among non Euro-american civilization and among non-dominant groups within contemporary civilization.	.35**	.04	.05	.06	.10	-.10
11.Compare specific characteristics (e.g., professions, institutions) of Euro-american societies with those same characteristics in other societies.	.24**	.05	-.06	.18*	-.06	.08
12.Understand that similarities among cultures can make solutions to some pressing human problems possible and illustrate how differences between cultures may make universal solutions to some human problems possible.	.30**	-.06	.15	.05	.04	-.08

4. Philosophy and Ethical Analysis

Factors associated with overall performance

To determine the factors associated with test scores of those students who took the Philosophy and Ethical Analysis test, total Philosophy and Ethical Analysis test scores were regressed on SAT verbal, SAT math, semester standing, grade points earned in quantitative courses, grade points earned in writing courses, grade points earned in philosophy and ethical analysis courses, grade points earned in other general education courses, and grade points earned in all other non-general education courses. The results of this regression can be found in Table 4.3.

Consistent with the findings in the Literature and the Arts and Culture and Modern Society analyses, SAT verbal again is the only significant predictor of total test scores on the Philosophy and Ethical Analysis test ($p < .01$) when all students (both freshmen and upper division) are considered. As SAT verbal scores increase, scores on this test increase substantially ($b = .34$).

Once again, some of the responses to this test instrument were essays. But a substantial portion was multiple choice items, so the association between verbal abilities and performance may well be due to the nature of the skills being tested.

Similar results are found in the analysis of upper division students only (Table 4.4). SAT verbal scores appear to be quite influential ($b = .29$, $p < .01$) in determining scores on the Philosophy and Ethical Analysis test, as do SAT math scores ($b = .18$, $p < .05$).

Factors associated with performance on individual goal items

When goals items are considered individually (Table 4.8), the relationship of SAT verbal to item scores is even more obvious; it is significant for eight of the eleven goals. No other variables significantly contribute to explaining variance in goal item test scores. Indeed, none of the variables included in the analysis explain a significant amount of the variance in students' abilities to identify ethical dimensions of human choice (Goal 6), analyze fundamental epistomological concepts such as knowledge (Goal 7), or learn the role of general philosophical principles in examination of contemporary issues (Goal 10).

When upper division scores are considered alone, SAT verbal remains associated with performance, but to a lesser degree than when freshmen and upper division students are considered together. The coefficient of the SAT verbal variable is significant for only four of the eleven goals. Therefore, it looks as though SAT verbal scores influence upper division students abilities to understand how arguments are constructed and evaluated (Goal 2), be familiar with the role of analysis in formulation, clarification, and acceptance of a thesis (Goal 3), analyze fundamental

ethical concepts such as good, right, duty (Goal 5), and have a grasp of the various ways in which logic, ethical, and other kinds of propositions can be supported (Goal 11). However, SAT verbal and all other independent variables fail to explain a significant amount of the variance in test scores on other goal items.

SAT math scores were significantly associated with the ability to be familiar with the role of analysis in the formulation, clarification, and acceptance or rejection of a thesis. No other variables were associated with upper division student performance on goals in this area.

Table 4.8.

Regression Results:Philosophy and Ethical Analysis Goal Items

FRESHMEN AND UPPER DIVISION
(N = 399)

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
1.Know the significant ideas and debates in philosophy through an analysis of the works of important philosophers.	.13*	.01	.05	.06	.09	.01
2.Understand how arguments are constructed and how they may be evaluated.	.29**	.02	-.03	-.03	.03	.07
3.Be familiar with the role of analysis in the formulation, clarification, and acceptance or rejection of a thesis.	.24**	.08	-.07	.02	.11	.13
4.Express and defend theses relevant to philosophical issues.	.13*	.04	-.02	.09	.06	.07
5.Analyze fundamental ethical concepts such as "good", "right", "duty", "moral responsibility", and "blame".	.14*	.02	-.19	.11	.12	.16
6.Identify ethical dimensions of human choice, in contrast to practical, technological, legal, empirical and other dimensions.	.12	-.06	-.29	.12	.22	.10
7.Analyze fundamental epistemological concepts such as "knowledge", "evidence", "defensibility", "introduction", and "verification".	.08	.00	.29	-.03	.05	-.16
8.Have a grasp of logic, deduction, validity, proof, and fallacies.	.25**	.01	.19	.00	-.11	.07
9.Examine in detail one or more contemporary issues concerning justice, gender, self, language, human relations, discrimination, sciences, reality,professional obligations, and religious beliefs.	.18**	-.05	.17	.03	.11	.03

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	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
10.Learn the role general philosophical principles play in the examination of contemporary issues.	.03	-.05	.06	.02	.19	-.08
11.Have a grasp of the various ways in which logic, ethical, predictive, explanatory, and other kinds of propositions can be supported.	.29**	.02	-.06	-.03	.10	.05

UPPER DIVISION STUDENTS ONLY
(N = 104)

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
1.Know the significant ideas and debates in philosophy through an analysis of the works of important philosophers.	.15	.07	.18	-.03	-.09	-.19
2.Understand how arguments are constructed and how they may be evaluated.	.19*	.13	-.06	-.03	-.02	.04
3.Be familiar with the role of analysis in the formulation, clarification, and acceptance or rejection of a thesis.	.20*	.18*	-.09	.06	.04	.11
4.Express and defend theses relevant to philosophical issues.	.15	.07	.17	-.02	-.10	-.16
5.Analyze fundamental ethical concepts such as "good", "right", "duty", "moral responsibility", and "blame".	.20*	.10	.13	.00	-.10	-.13
6.Identify ethical dimensions of human choice, in contrast to practical, technological, legal, empirical and other dimensions.	.15	.07	.06	.00	-.05	-.14
7.Analyze fundamental epistemological concepts such as "knowledge", "evidence", "defensibility", "introduction", and "verification".	.11	.02	.22	-.06	-.07	-.23
8.Have a grasp of logic, deduction, validity, proof, and fallacies.	.16	.11	-.06	.06	-.09	.13
9.Examine in detail one or more contemporary issues concerning justice, gender, self, language, human relations, discrimination, sciences, reality,professional obligations, and religious beliefs.	.12	.04	.17	-.07	-.10	-.22
10.Learn the role general philosophical principles play in the examination of contemporary issues.	.05	.10	.02	-.02	.01	-.13

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
11.Have a grasp of the various ways in which logic, ethical, predictive, explanatory, and other kinds of propositions can be supported.	.23**	.13	-.03	-.04	.02	-.02

5. Social Science and Comparative Analysis

Factors associated with overall performance

To determine the factors associated with test scores of those students who took the Social Science and Comparative Analysis test, total Social Science and Comparative Analysis test scores were regressed on SAT verbal, SAT math, semester standing, grade points earned in quantitative courses, grade points earned in writing courses, grade points earned in social science and comparative analysis courses, grade points earned in other general education courses, and grade points earned in all other non-general education courses. The results of this regression can be found in Table 4.3. SAT verbal scores again proved to have a strong influence on test score in Social Science and Comparative Analysis ($b = .41$, $p < .01$). Semester standing also explained a significant amount of the variation in test scores in this area ($b = .41$, $p < .05$). No other variables contributed significantly to overall Social Science and Comparative Analysis test scores when freshmen and upper division students were considered together.

When upper divisions students are considered alone, SAT verbal remains an influential variable ($b = .40$, $p < .01$). However, semester standing no longer plays as great a role ($b = .02$). Instead, SAT math scores are significantly related to scores on the Social Science and Comparative Analysis test ($b = .18$, $p < .05$). Thus, it appears that, for upper division students, SAT scores are the only variables that influence their scores on the test in this area.

The test forms in this area were all multiple choice, but students responded to a series of articles. The effect of the verbal comprehension component of their abilities may have obscured smaller curriculum effects.

Factors associated with performance on individual goal items

A look at the regressions of these variables on scores for individual goal items reveals that SAT verbal scores significantly predicted scores on each of the thirteen goals (see Table 4.9). In addition to SAT verbal scores, semester standing ($b = .58$, $p < .01$) and grade points earned in non-general education courses ($b = -.28$, $p < .05$) were associated with students' abilities to identify the criteria for empirically testing hypotheses derived from social science theories (Goal 6). SAT math scores ($b = -.15$, $p < .01$) helped explained variance in students abilities to evaluate social science theories and perspectives about human behavior through comparative analysis (Goal 11). This negative coefficient suggests that the lower students' SAT math scores, the greater their scores on the item corresponding to this goal. However, grade points earned in Social Science and Comparative Analysis courses were significant predictors of scores of this same Goal 11 ($b = .21$, $p < .01$).

When scores on individual goal items were analyzed for upper division students only, SAT verbal remained a strong influence on scores for nine of the thirteen items. Grade points earned in Social Science and Comparative Analysis courses contributed to explaining variation in students' abilities to understand the limits of generalizability of specific findings (Goal 7) and in students' abilities to evaluate Western social science theories through comparative analysis (Goal 11). It is interesting to note that while grade points earned in the area were positively related to scores on Goal 11 ($b = .18$, $p < .05$), this same variable affected students' abilities to understand the limits of generalizability for specific findings (Goal 7) in the opposite way ($b = -.15$, $p < .05$). That is, the more grade points students had earned in Social Science and Comparative Analysis courses, the less likely they were to do well on the item corresponding to Goal 7. There is no clear explanation for this result.

The results for Goal 11 items suggest that as semester standing increases, students' abilities to evaluate Western social science theories decrease ($b = -.29$, $p < .05$), possibly indicating a forgetting effect. Also, grade points earned in courses outside the general education curriculum are associated with students' abilities to critique myths and stereotypes about human nature (Goal 10; $b = .17$, $p < .05$).

Table 4.9.

Regression Results: Social Science and Comparative Analysis Goal Items

FRESHMEN AND UPPER DIVISION
(N = 545)

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
1.Understand how relationships (economic, political, social, spatial) develop, persist, and change between individuals and groups or between societies.	.20**	.00	.29	-.01	.04	-.13
2.Differentiate patterns and structures of social systems and institutions.	.19**	.07	.13	.04	.07	.03
3.Identify the impact of various social institutions and practices groups in society; e.g. women, minorities, the poor.	.26**	.04	.28	-.03	.11	-.16
4.Have a basic understanding of how to think analytically, and recognize abstract patterns.	.13*	.14	.08	.07	.08	-.04
5.Have a basic understanding of how to recognize propositions of a theory which are empirically verifiable.	.28**	-.01	.45*	-.09	.05	-.18
6.Have a basic understanding of how to identify the criteria for empirically testing hypotheses derived from social science theories.	.23**	.01	.58**	-.12	.00	-.28*
7.Understand the limits of generalizability for specific findings.	.30**	-.05	.37	-.14	.10	-.11
8.Understand how individuals are socialized as members of groups and societies; i.e., families, informal groups, organizations, cultures.	.21**	-.05	.11	.09	.07	-.03
9.Understand the ways in which individuals, both alone and collectively, change the groups and societies in which they live.	.26**	-.06	.34	.04	.10	-.18

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
10. Identify and critique myths and stereotypes about human nature; e.g., class differences, male/female differences, racial differences.	.23**	-.06	-.08	.07	.21*	.04
11. Evaluate Western social science theories and perspectives about human behavior through comparative analysis.	.16**	-.15**	.00	.21**	.00	.03
12. Recognize how social science knowledge can assist in understanding social issues (e.g. racism, poverty) and human interaction patterns (e.g. childrearing, male-female relations).	.14**	.07	.07	.04	.14	-.05
13. Recognize the permeating role of political and economic systems in society.	.36**	-.08	.01	.05	.12	.13

UPPER DIVISION STUDENTS ONLY
(N = 197)

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
1.Understand how relationships (economic, political, social, spatial) develop, persist, and change between individuals and groups or between societies.	.18*	.08	-.12	.04	.00	.05
2.Differentiate patterns and structures of social systems and institutions.	.17*	.04	-.07	.08	.07	.14
3.Identify the impact of various social institutions and practices groups in society; e.g. women, minorities, the poor.	.21**	.28**	.16	-.01	.06	-.22
4.Have a basic understanding of how to think analytically, and recognize abstract patterns.	.11	.17	.04	.01	-.01	-.09
5.Have a basic understanding of how to recognize propositions of a theory which are empirically verifiable.	.32**	.15	.08	-.05	.00	-.10
6.Have a basic understanding of how to identify the criteria for empirically testing hypotheses derived from social science theories.	.19*	.12	.13	-.07	.01	-.15
7.Understand the limits of generalizability for specific findings.	.31**	.05	.15	-.15*	.06	-.10
8.Understand how individuals are socialized as members of groups and societies; i.e., families, informal groups, organizations, cultures.	.08	-.02	-.18	.11	.06	.18
9.Understand the ways in which individuals, both alone and collectively, change the groups and societies in which they live.	.18*	.05	-.09	.07	.09	.00

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
10. Identify and critique myths and stereotypes about human nature; e.g., class differences, male/female differences, racial differences.	.17*	-.06	-.12	.07	.17*	.08
11. Evaluate Western social science theories and perspectives about human behavior through comparative analysis.	.14	-.09	-.29*	.18*	-.02	.22
12. Recognize how social science knowledge can assist in understanding social issues (e.g. racism, poverty) and human interaction patterns (e.g. childrearing, male-female relations).	.06	-.04	-.25	.09	.09	.23
13. Recognize the permeating role of political and economic systems in society.	.27**	.04	-.22	.09	.08	.25

6. Science and Technology

Factors associated with overall performance

To determine the factors associated with test scores of those students who took the Science and Technology test, total Science and Technology test scores were regressed on SAT verbal, SAT math, semester standing, grade points earned in quantitative courses, grade points earned in writing courses, grade points earned in science and technology courses, grade points earned in other general education courses, and grade points earned in all other non-general education courses. The results of this regression can be found in Table 4.3. As expected, SAT math scores were a strong indicator of scores on the Science and Technology test ($b = .21$, $p < .01$), as were grade points earned in science and technology courses ($b = .14$, $p < .05$) and grade points earned in quantitative courses ($b = .12$, $p < .05$). No other variables contributed significantly to explaining scores on the test in this area when all students (both freshmen and upper division) were considered together. When upper division students are considered alone (see Table 4.4), the only significant independent variable was SAT math score ($b = .32$, $p < .01$). Although most upper division students had completed the science and technology course requirements, it appears that differential performance (differing grade points) are not associated with performance on this instrument.

Factors associated with performance on individual goal items

Goals in Science and Technology were analyzed in groups as noted in Table 4.9. SAT math scores were significantly related to students' abilities to use and interpret numerical data (Goal A; $b = .29$, $p < .01$) and to understand and use scientific and technological facts (Goal D; $b = .18$, $p < .01$). Grade points earned in science and technology courses were also significant predictors of scores on items related to these two goals ($b = .25$, $p < .01$ and $b = .19$, $p < .01$, respectively). On the other hand, SAT verbal scores were the only variables that explained variance in scores on items related to overall Goals B and C. That is, students' abilities to relate scientific or technical data to society (Goal B) and to understand the scientific method (Goal C) depended on SAT verbal scores ($b = .17$, $p < .01$ and $b = .14$, $p < .05$) rather than any of the other independent variables included in the analysis.

When upper division students' goal item scores are considered alone, similar results are found (see Table 4.10). SAT math score remained a significant explanatory variable for scores on Goals A and D ($b = .37$, $p < .01$ and $b = .32$, $p < .01$, respectively), as did grade points in Science and Technology courses ($b = .23$, $p < .01$ and $b = .15$, $p < .05$). Again, students' abilities to relate scientific and technical data to society (Goal B) depends most heavily on students' SAT verbal scores ($b = .22$, p

< .01). However, none of the independent variables included in the analysis explains a significant portion of the variance in scores on items corresponding to Goal C, when upper division students' scores are considered alone.

Table 4.9.

Regression Results: Science and Technology Goal Items

FRESHMEN AND UPPER DIVISION
(N = 600)

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
GOAL A. Numeracy: 1. Interpret numerical information. 2. Predict future outcomes based on numerical data. 3. Generalize from numerical and statistical data. 4. Solve numerical problems.	.01	.29**	-.07	.25**	.03	.18
GOAL B. Science, Technology, and Society: 1. Distinguish scientific values appropriate in making social and ethical decisions from those which are not. 2. Relate scientific or technical data to political, economic, ecological, social, and ethical issues. 3. Distinguish facts from interpretation, given a controversial scientific or technological issue impacting society. 4. Distinguish concepts derived by scientific and unscientific means, given a controversial issue. 5. Evaluate statements of technical experts in public forums.	.17**	-.02	.14	-.01	.01	.12
GOAL C. Paradigms of Science and Technology 1. Recognize models as part of scientific inquiry. 2. Identify limitations of scientific observation. 3. Apply the scientific method by producing a hypothesis, given data, or given a hypothesis, produce facts to back it up. 4. Revise a set of generalizations, given new evidence.	.14*	.03	.17	.00	.00	.00

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
GOAL D. Facts and Concepts of Science and Technology	.07	.18**	.00	.19**	.01	.12

1. Give examples of basic facts and theories of one discipline.
2. Distinguish basic science from technological implications.
3. Deduce information from scientific and technical facts.

UPPER DIVISION STUDENTS ONLY
(N = 219)

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
GOAL A.						
Numeracy	.04	.37**	-.09	.23**	-.06	.08
1. Interpret numerical information.						
2. Predict future outcomes based on numerical data.						
3. Generalize from numerical and statistical data.						
4. Solve numerical problems.						
GOAL B.						
Science, Technology, and Society	.22**	.06	-.05	-.06	-.05	.14
1. Distinguish scientific values appropriate in making social and ethical decisions from those which are not.						
2. Relate scientific or technical data to political, economic, ecological, social, and ethical issues.						
3. Distinguish facts from interpretation, given a controversial scientific or technological issue impacting society.						
4. Distinguish concepts derived by scientific and unscientific means, given a controversial issue.						
5. Evaluate statements of technical experts in public forums.						
GOAL C.						
Paradigms of Science and Technology	.11	.11	.10	-.05	-.02	.01
1. Recognize models as part of scientific inquiry.						
2. Identify limitations of scientific observation.						
3. Apply the scientific method by producing a hypothesis, given data, or given a hypothesis, produce facts to back it up.						
4. Revise a set of generalizations, given new evidence.						

	SAT Verbal	SAT Math	Sem. Stding	Area GPts	Other Gen.Ed. GPts	Non-Gen.Ed. GPts
GOAL D. Facts and Concepts of Science and Technology	.11	.32**	-.13	.15*	-.08	.05
1. Give examples of basic facts and theories of one discipline.						
2. Distinguish basic science from technological implications.						
3. Deduce information from scientific and technical facts.						

APPENDIX 5

PROJECT EVALUATION DETAILS BY ACADEMIC ADMINISTRATION

Deans' Evaluation of General Education Assessment Project

Questionnaires were sent to 15 Deans representing the Schools of Business Administration, English, Education, Family Studies, Arts and Sciences, Pharmacy, Nursing, Allied Health, Agriculture and Natural Resources, Law, Social Work, International Affairs, Extended and Continuing Education and the Graduate School. A questionnaire was also sent to the Provost. The questionnaire contained two parts, the first part asked the deans for their agreement on a number of statements about the project (1 indicated strong agreement and 7 indicated strong disagreement). The second part contained some open ended questions which asked the deans to comment about the usefulness and future of the assessment research. Five deans and the provost have responded to the questionnaire in the week since it was sent out. One dean responded that, as an interim dean, he did not feel qualified to comment. Another dean did not complete the questionnaire, but evaluated the research project in a separate letter. His comments are included in the summary of open ended responses.

Summary of Scale Responses

Overall, the six respondents indicated that the project is important, useful for academic planning, and should be continued. However, while they agree the research is a valid assessment of the general education curriculum, all six respondents believe that the area goals should be revised.

They also believe that the project is neither too costly nor time consuming. It appears that these individuals are uncertain, however, about the level of awareness and support the project has among students. They generally agree that the faculty are aware of and support the assessment project.

Items were combined and individual responses are reported below. The actual scale ratings are included in parentheses.

<u>Project Evaluation</u>

Five of the six respondents strongly agreed (1) and one agreed (3) that the general education assessment project is important. Five of the respondents strongly agreed (1) and one person agreed (2) that the project should be continued.

Five of the six respondents disagreed that this research is too costly. One dean did not respond to this item. Two deans strongly disagreed (7) that the research is too time consuming with three more also disagreeing (6). One dean was neutral (4).

Implications of results

Four of the respondents agreed (2) that the research will be useful for improving the general education program, while one strongly agreed (1). One respondent remained neutral in his evaluation of the project's usefulness. Three deans strongly agreed (1) and 1 agreed (2) that this research is useful for academic planning. One dean was neutral in his assessment (4).

Validity

Three deans agreed (2) and one strongly agreed (1) that the research represents a valid assessment of the general education curriculum, and one respondent disagreed (5). One dean didn't respond to the item. All five agreed that the general education curriculum goals should be revised.

Awareness and Support

Among Faculty

Five of six respondents agreed and one disagreed that the research program has faculty support. One respondent strongly agreed, four agreed (2 and 3) and one disagreed (6) that there is sufficient awareness of the project among faculty.

Among Students

Of the six respondents, only three rated student support. Two respondents agreed (2 and 3) and one remained neutral about the student support of the project. One person strongly disagreed, one person disagreed (6) and two persons agreed (2 and 3) that there is sufficient awareness of the project among students. Two deans did not respond to this statement.

Summary of Open Ended Responses

Three of the deans and the provost completed this part of the questionnaire. Their responses to each of the items are listed below.

In what ways do you see the results of this research on general education as being of use to faculty members?

- "Should lead to revision of courses."
- "Confirms value of the program and courses."

To Departments?

- "May consider different ways (regarding different combinetions of courses) to meet objectives."

To Colleges, Schools, or Divisions?

- "It provides a means for assessing involvement in general education of students for whom we have responsibilities."

- "It is therefore helpful in decision making in a time of scarce resources."

- "Stimulus for more interdisciplinary work."

- "Improve overall curriculum"

In what ways do you think this research can be used to enhance the general education program?

- "Provides data for focusing/targeting areas for remedial courses."

- "Focus teaching and content toward specified goals"

What specific items do you believe we should focus on in future assessment research?

- "There is a specific need to stratify the sample so as to allow for assessment of the model in relation to various subgroups which barely show up in the general sample (e.g. African Americans, Asian Americans, Hispanics, international students). This is especially where the SAT verbal scores are included as a variable."

- "Whether fewer general education requirements i.e. fewer courses would have approximately the same effect across the curriculum."

- "Validation of goals as significant mark of an educated person."

Is there any information not contained in this report which you feel would be useful?

No responses

Comments, clarifications and explanations:

- "I very much appreciate being apprised of this difficult but extremely well executed project."

- "Good, thoughtful, helpful project."

- "The study is seriously flawed if GER is a consideration. The lack of a control group prevents the investigators from reaching any conclusions as to the value of GER

compared to another required elective system such as distribution requirements. Did not address the issue of attrition. Random selection of juniors would result in the inadvertent inclusion of transfer students with different lower division experiences. Transfer students would constitute a loosely defined control group.

"An exceptionally fine effort."

Table 5.1. Summary of Deans and Provost responses to statements about the general education assessment project (n=6).

EVALUATIONS	AGREE	DISAGREE	NEUTRAL	NO ANSWER
1. The project is too costly.	0	5	0	1
2. The project is too time consuming.	0	5	1	0
3. The project is important.	6	0	0	0
4. The project should be continued.	6	0	0	0
IMPLICATIONS OF RESULTS				
1. Project will help improve GE program.	6	0	1	0
2. Results are useful for academic planning.	6	0	1	0
VALIDITY OF RESEARCH				
1. Research is a valid assessment of GE curriculum.	4	1	0	1
2. The area goals should be revised.	6	0	0	0
AWARENESS AND SUPPORT				
1. The program has faculty support.	5	1	0	0
2. The program has student support.	2	0	1	3
3. Students are aware of the project.	2	2	0	2
4. Faculty are aware of the project.	5	1	0	0

Note:
AGREE represents raw responses of 1, 2, and 3 to the statements.
DISAGREE represents raw responses 5, 6, and 7.
NEUTRAL represents responses of 4.

APPENDIX 6

EVALUATION OF GENERAL EDUCATION TEST INSTRUMENTS BY FACULTY AND STUDENTS

During the course of the project we obtained evaluations of the test instruments from the students who took the exams, and from individuals trained to score the exams. The procedure and results of student and grader evaluations are summarized below.

Review of Comments on Test Instruments by Graders

Graduate students trained to score material in each of the general education areas (excluding Social Sciences and Science and Technology, which used only multiple-choice questions) were asked to rate how well the test forms for each of the general education areas provided a valid assessment of student performance on the goals developed by the faculty committees. Graders were used to rate the forms because of their familiarity with the curriculum content in their general education areas, and their first hand knowledge of the instruments. No graders were available to evaluate the Social Science and Science and Technology forms since all four forms were computer scored. A faculty member for the Science and Technology area committee recommended a graduate teaching assistant who reviewed both forms and completed the evaluation. A faculty member teaching social science area courses who did not participate in developing the test instruments rated the forms for that area.

The survey consisted of a list of each of the general education goals for the area. Graders were asked to rate how well the forms provided an assessment of student performance on each of the goals, using a scale ranging from 1 (Not at all) to 7 (Very well). At least one grader from each of the areas responded to the survey. Graders for German test forms did not respond to the survey. Reviewers of material in Philosophy and Ethics, Arts and Literature, French and Spanish provided written open ended comments in addition to completing the survey. Since the feedback for the forms in each area is limited to only one observation there is obviously no statistical significance to the results. However, even individual feedback can provide information useful for revising the goals for each area and for adjusting test items used to measure performance on the goals.

Foreign Languages

French. There were discrepancies in roughly half the responses between reviewers for French foreign language forms. One reviewer rated more than half the goals as not at all measured with the items on both forms. The second reviewer responded that the forms provided a more than adequate measure of grammatical struc-

ture, vocabulary and a balanced achievement of speaking, listening and reading and writing skills. Both reviewers responded that the forms provided a measure of student's knowledge and use of the basic grammatical structures and speaking and sound systems of the French language. Goals developed to provide an understanding of the foreign culture and of the students own culture were rated as not at all validly measured by the items on both forms.

Spanish. The reviewers of Spanish language forms generally agreed in their ratings of how well these forms measured performance on the specified goals. Goals designed to display knowledge of vocabulary and grammatical structure and to display a student's knowledge of how language may be of future or recreational use were measured by the two forms. All other goals were believed to be only weakly measured, if at all, by the two forms. The graders also recommended that the forms be more consistent with the material and vocabulary taught in the university curriculum. Their concern was that much of the Spanish language is regional and that word choice and the accents of voices on tape be more consistent with the language and accents students are exposed to in the classroom and language lab. They also recommended that the Culture Section be revised to include less political and sociological material because there is little uniform coverage of these areas in student coursework. They believe students may exhibit more knowledge about food and religion of Spanish speaking countries than on the political situations in these diverse countries. Finally, it is suggested that the multiple choice answers in Listening Sections be reviewed. The answers are so similar that detecting a correct answer is too difficult.

Graders for each of the languages commented that the Culture Section included in each of the forms provided little measure of student understanding of target cultures. They suggest that the Culture Section passages, the student's answers, or both the instructions and answers, be written in the target language.

Arts and Literature.

The reviewers were generally positive about the material but commented that the instructions needed to be more clear throughout both forms. It was recommended that the initial instructions specify "how" and "why" the student should answer questions about the three works of art. One reviewer mentioned that students appeared to be too concerned with how "correct" or "incorrect" their answers were and this may have inhibited their ability to apply their analytical skills rather than specific knowledge about art to questions which involved comparing the art forms. Both reviewers were concerned about the apparent insufficient time allotted for completing such challenging tests. They were concerned that students were not given sufficient time to read the instructions carefully and to prepare thoughtful responses.

Culture and Modern Society.

The forms for this area were the most weakly rated of all six general education areas. Ten of the 11 goals for this set of forms were rated as being measured by the forms at below average levels.

Philosophy and Ethical Analysis.

The graders rating this form believed that the instruments designed for this area provided an average measure of performance on specific goals. Most of the goals received scores of 4's and 5's. The lowest rated goal involved the adequacy of the tests to measure the student's ability to "Express and defend theses relevant to philosophical issues". It was rated a 2 on the 7 point scale.

One reviewer commented that the locally developed test (Form 05) "is more historically minded than the Cornell Critical Thinking Test Level Z standardized form (Form 06) but at the same time does not involve the same kind of puzzle solving skills that the 'Z' requires." This reviewer went on to say that "the Cornell test is almost a junior varsity version of the LSAT, while the UCONN test is clearly designed to track both the evolution of 'ethical sensibilities' and the ability to recognize an argument as well as a specific body of facts. All in all, I think that both tests probably do their jobs very well".

Social Science and Comparative Analysis.

The reviewer commented that these forms "appeared to be a reading test and not an analysis of applying knowledge to basic principles or understanding the concepts separate from information presented". Overall, however, the instruments for this area received above neutral evaluations by the rater in their ability to meet the goals. Only four of the 12 goals received a 4 or lower rating. The reviewer thought that items included in the test did a less than average job of measuring student's ability to think analytically and recognize abstract patterns. There was also limited evidence that a student's ability to recognize propositions of a theory which are empirically verifiable and to identify the criteria for empirically testing hypotheses derived from social science theories were being measured using the items on these forms.

Science and Technology.

The instruments were rated above neutral in their ability to measure 10 of the 15 goals for this area. However, the reviewer believed that the items in the instruments provided only a weak measure of a student's ability to distinguish facts from interpretation and for identifying concepts derived by scientific rather than unscientific means. The reviewer also did not be-

lieve that the instrument provided a test of the student's ability to evaluate the opinions of technological experts and only provided a weak test of a student's appreciation that science and technology involve many disciplines and that the student be conversant with informational characteristics of more than one of those disciplines.

Review of Comments on Test Instruments by Students.

The final page of every test form contained a short attitude survey asking students for their evaluation of the time allotted for the test. Students were also asked to describe their general feelings about taking the test. Student responses ranged from one word comments to short paragraphs consisting of multiple comments. Responses from all three test administrations (Summer freshmen, Fall and Spring upper division students) were content analyzed by two teams of two independent judges who coded the individual responses into 21 possible categories. A random selection of forms from each administration was included in the analysis. An attempt was made to ensure that an equal number of responses from both upper division and incoming students were included. Responses from 306 freshmen forms and 367 upper division forms were included in the analysis.

The descriptions for most of the categories are fairly straightforward, and Table A6.1 lists the label for each category. Category 1 "Representative of test type" is a category developed from responses that stated the test was "nothing like" or "very similar to" types of tests taken in courses at UCONN. A separate category, number 17, was included to classify the same type of remark, only referencing High School courses, which were made by incoming freshmen. Responses placed into Category 16 "Comments about test form and content" included comments like "Poor instructions", "Answers based on wording of questions and instinct rather than on understanding of material", "An exercise in reading comprehension", and "Dialogue spoken too slow". A frequent neutral comment about test content and form was that the test was "different". Some responses categorized into "Comments about test Administration" included "Desks cramped together", "Discouraged due to Pay delay" and "More scrap paper needed". "General Other" responses included those responses not clearly identified as belonging to any specific category. Most of the "General Other" responses had to do with the personal feelings about the exam and the student's general performance. Some of the negative responses included comments like "Not my Major", "Ridiculous", or "I'm an engineering major not a history major". An example of a neutral "general other" response included "Weird" and a positive general other responses included "Fun" and "Groovy". A list of coding categories is included in Table A6.1.

Content Analysis Reliability. Interrater reliability coefficients for coding the comments were computed between pairs of

judges using a standard agreement formula. This formula provides a coefficient which represents the percent of agreement in responses between coders applying the same set of categories to the same content. Interrater reliability coefficients for each pair of judges across areas were .81 and .89, where 1.00 indicates perfect agreement and 0.0 indicates no systematic agreement.

General Comments. Overall, the within area comments indicate that students did not systematically perceive any dramatic weaknesses in the forms for any of the six areas. One of the more consistent student responses from the Science and Technology instruments indicated that the student needed more time to complete the test. However, a majority of students (57%) indicated that they had adequate or more than adequate time for completing the tests (See Table A6.2). The most frequent responses for each area (reported as percentages) are included in Table A6.1.

Although many of the most frequent codes were negative, this finding is negligible given the small percentages and the sample size. All comments were combined to provide a look at how students perceived general education assessment instruments as a group. This procedure yielded 673 evaluations. The most frequently cited comments across forms are also included in the summary table. The most frequent comment was that the material was "difficult or complicated". This is to be expected in test forms which address high-level skills across such a broad area. Even then, less than 20% of the students made this criticism.

Table A6.1

Summary Table of Most Frequent Comments by Area

Area	Comment	Percent
Foreign Languages N=216		
	Difficult/Complicated	23%
	Very Tired	22%
	General comments,negative	16%
Literature and the Arts N=81		
	Interesting	17%
	General comments,neutral	14%
	Very tired	12%
	Thought provoking	11%
	Difficult/Complicated	11%
	Neutral comments about test form and content	10%
Culture and Modern Society N=99		
	Difficult/Complicated	16%
	Interesting	15%
	Did not like test	14%
	General comments,neutral	13%
	General comments,negative	11%
Philosophy and Ethical Analysis N=69		
	Difficult/Complicated	16%
	Unclear	15%
	Felt good about testing	12%
	General comments,negative	12%
	Very tired	11%
	Positive comments about test form and content	10%
	General comments,neutral	10%
Social Science and Comparative Analysis N=89		
	Interesting	18%
	Negative comments about test form and content	14%
	Easy	12%
	Unclear	10%
	General comments,neutral	10%

Table A6.1 (continued)

Summary Table of Most Frequent Comments by Area

Area	Comment	Percent
Science and Technology N=119		
	Less than adequate time	31%
	Difficult/Complicated	24%
	Negative comments about test form and content	21%
	Very tired	10%
SUMMARY Across Areas N=673		
	Difficult/Complicated	18%
	Very tired	16%
	General comments,negative	11%
	Interesting	10%
	Negative comments about test form and content	10%

Evaluations of time adequacy by students.

Students generally indicated that they had sufficient time available for completing the individual forms. Over half of the responses for Science and Technology and Literature and the Arts indicated that they were given adequate or more than adequate time to complete the forms for these areas. A clear majority of the students tested in all other areas indicated that were given adequate or more than adequate time for completing the exams.

Table A6.2

Time Adequacy Evaluations

	Less than Adequate	Adequate	More than Adequate
Science and Technology	31%	30.3%	26.7%
Literature and the Arts	33.3%	28.4%	38.6%
Culture and Modern Society	23.3%	42.4%	33.3%
Social Sciences	5.6%	29.2%	65.2%
Philosophy and Ethics	20.3%	36.2%	43.5%
Across Areas	27.7%	33.4%	36.7%

APPENDIX 7

DISSEMINATION: REQUESTS FOR INFORMATION

The institutions which have contacted the UConn General Education Assessment Project, requesting information about the project and/or copies of the assessment instruments are listed below. The different titles of the persons requesting the information are also listed.

The project continues to receive an average of about one inquiry per week. Our continuing funding from the Provost's Office permits us to provide free copies of sample instruments, and summary reports at no cost to requesters.

INSTITUTIONS

Arizona State University	Tempe	AZ
Augustana College	Rock Island	IL
Bethel College	Saint Paul	MN
California State University	Fullerton	CA
California State University	Northridge	CA
Central Missouri State University	Warrenburg	MO
Chicago State University	Chicago	IL
Clayton State College	Morrow	GA
College of William & Mary	Williamsburg	VA
College of Saint Benedict	Saint Joseph	MN
College of Saint Francis	Joliet	IL
DeKalb College	Decatur	GA
Dyke College	Cleveland	OH
East Texas State University	Texarkana	TX
Erie Community College	Williamsville	NY
Florida International University	Miami	FL
Goldey-Beacom College	Wilmington	DE
Indiana University	East Richmond	IN
Keene State College	Keene	NH
Kutztown University	Kutztown	PA
Massasoit Community College	Brockton	MA
Mattatuck Community College	Waterbury	CT
Middlesex Community College	Edison	NJ
Montgomery County Community College	Blue Bell	PA
Mount Ida College	Newton	MA
Northeastern State University	Tahlequah	OK
Northern Kentucky University	Highland Heights	KY
Pennsylvania State University	University Park	PA
Plymouth State College	Plymouth	NH
Saint Mary's College	Winona	MN
Southeast Missouri State University	Cape Girardeau	MO
St. Bonaventure University	St. Bonaventure	NY
St.Norbert College	De Pere	WI
SUNY Institute of Technology	Utica	NY
SW Texas State University	San Marcos	TX
University of Hartford	West Hartford	CT
University of Kentucky	Lexington	KY
University of Massachusetts	Boston	MA
University of New Hampshire	Durham	NH
University of Northern Colorado	Greeley	CO
University of Oklahoma	Norman	OK
University of South Carolina	Aiken	SC
University of South Florida	Tampa	FL
University of Tennessee	Knoxville	TN
Utah State University	Logan	UT
Western Illinois University	Macomb	IL
Westminster College	Salt Lake City	UT
Winthrop College	Rock Hill	SC

TITLES OR DEPARTMENTAL AFFILIATIONS OF THOSE REQUESTING INFORMATION ABOUT THE UCONN GENERAL EDUCATION ASSESSMENT PROJECT

Academy for the Art of Teaching
Assessment Coordinator
Assessment Supervisor
Assistant Vice President for Academic Affairs
Associate Dean/Director
Associate Director-Center for Assessment Research and Development
Associate Professor-Core Curriculum Council
Chairman-Department of Chemistry
Chairman-Humanities
Chair-Faculty Professional Development Committee
Chair-Social Science Division
College of Basic Studies
College of Public & Community Service
Coordinator of Assessment
Coordinator-Assessment Program
Coordinator-Academic Skills
Coordinator-Academic Assessment
Coordinator-SCHEA Network
Coordinator-Undergraduate Reading
Department of General Studies
Department of Psychology
Department of English
Department of Philosophy
Director of Academic Assessment
Director-Academic Assessment
Director-Academic Advising/Academic Affairs
Director-Center for Teaching Enhancement
Director-Faculty Development
Director-Institutional Research
Director-Office of University Evaluation
Executive Director of Research and Planning
General Education Assessment
Humanities and Social Sciences
Liberal Arts and Sciences
Office of Academic Advising
Philosophy Department
Sociology Department
Special Assistant to the Provost
Speech Communication
Vice President for Academic Affairs

APPENDIX 8

STUDENT SELF EFFICACY IN GENERAL EDUCATION GOAL AREAS

In his theory of social cognition, Albert Bandura (Social Learning Theory, Englewood Cliffs, NJ: Prentice Hall, 1971) considers how social interactions create self-beliefs of competence. Such perceptions of skill are termed "self-efficacy beliefs". Bandura and his colleagues have shown that self-efficacy perceptions influence whether a person will choose a particular task, persist at that task in the face of obstacles, and experience success at that task.

In this portion of the General Education Curriculum Assessment Project, we developed six self-efficacy instruments, one for each of the curriculum areas. The previously developed goal statements for each area formed the core of the self-efficacy tools. Students were asked to self-assess their competence in performing each of the goals, using a five-point scale (5= Quite a Lot of Competence, 1= Very Little Competence).

Procedure

724 students recruited from several different large introductory level undergraduate courses and some upper-division courses were surveyed using the questionnaires described above. While this group is a convenience sample and is therefore not representative of the university population, it does consist of students from various disciplines located throughout the university. Students' semester standings ranged from 1st to 8th semester and were fairly balanced representation of lower and upper-division students. The surveys were administered to the students in class.

SUMMARY OF SELF-EFFICACY RESULTS

An analysis of the findings for each of the six areas are summarized below. Standardized scores (z-scores) are reported for describing the variation in student beliefs about their competence on goals relative to other goals within the same area. Individual within-area goal z-scores are also compared to self-efficacy responses to all goal statements averaged across the six groups.

Standardized scores represent response variations from the mean. Negative z-score values represent values falling below the mean and positive z-scores represent values greater than the mean. Z-scores usually fall between 2 and - 2, although the scores may go higher or lower than this range.

The z-scores for individual area goals compared to the average score for all goals across the six separate areas can be used to evaluate how a particular goal within an area compares to responses to all goals across all areas.

Foreign Languages

Within Area

The range of average responses for 13 goals for this area were 2.68 to 3.85 with an overall average of 3.46. This area had the second highest overall average of the six areas. Students in foreign languages felt less competent in their reading and writing skills as indicated in their responses which fall below the mean ratings for all the goals in this area ($z=-.82$). Students felt more competent ($z=.54$) in their understanding of the relationship between language and culture. They felt equally competent at understanding the concept of ethnocentrism and its impact on their views and behavior ($z=.53$). Correlation coefficients were calculated to determine the relationship between how long students have studied at the University and how well they feel they have achieved each of the area goals. It is apparent that as students continue with their education they feel less competent at speaking and listening in a target language ($r=-.22$, $p<.05$). This negative relationship is not surprising in that as time passes students would tend forget some of these skills, and subsequently feel less competent in their ability to speak and listen in a target language. Semester standing was not related to competency ratings on any other goals.

Across Areas

Students feel better about their basic knowledge about grammar of the target language (Goal 1, $z=.53$) and in the understanding the relationship between language and culture (Goal 6, $z=.60$), as well as in the impact ethnocentrism has on their own views and behavior (Goal 8, $z=.59$) than all students feel about their achievement on all goals. They do, however, feel particularly weak in their development of reading and writing skills in the classical languages (Goal 4, $z=-.93$). In the case of the low rating for this goal, it simply may be that students may not have taken these courses.

Literature and the Arts

Within area

Mean scores for goal responses for Literature and the Arts group ranged from 2.47 to 3.73. This area had the lowest overall mean (3.10) of all six areas. Student responses indicate that they perceive themselves to be most competent in viewing literature and the arts as integral to all human life and society, and not merely as the special interest of artists or an elite few. This is indicated in the standardized score for Goal 13 which is nearly one full standardized unit (.93) above the mean. Students rated their familiarity with representative works of women, non-western and racial/ethnic authors to be lower than their overall competence on the goals within this area (Goals 9,10 and 11). Z-

score responses for goals representing student competence in demonstrating this familiarity were all negative.

There were only three significant correlations between scale means and semester standing. As more time is spent at the university students feel less able to understand how literary and artistic criticism have change over time (Goal 6, $r=-.22$, $p<.05$). Student competence on goals which require students be able to demonstrate a conceptual basis in literature and the arts that provides entry into the discipline was negatively correlated with semester standing ($r=-.18, p<.05$). The responses also indicate that the more time students spend at the University the less confident they feel in their familiarity with representative works by Black, Hispanic, Asian and other racial/ethnic authors and artists. In addition to having one of the lowest competence ratings of all goals within this area ($z= -.89$), and being negatively correlated with semester standing.

Across Areas

Competence ratings for this area indicate that students feel least competent in their abilities to meet the goals established for this area relative to competence of students for all areas combined. Students confidence in their familiarity with representative works by Black, Hispanic, Asian and other racial/ethnic authors was the second lowest rated goal of all goals across all of the six areas ($z=-1.53$). Only one goal was rated above the mean for the standardized scores for all area goals. The only goal in this area rated above this group mean was student ability to view literature and the arts as integral to all human life and society, and not merely as the special interest of artists or an elite few (Goal 13, $z=.42$).

Culture and Modern Society

Within Area

Average responses for each of the 12 goals ranged from 2.58 to 3.83. The overall average for this area was 3.22. In general, students reported that they feel less competent at identifying the historical origins of the conditions which prevail among non-Euroamerican civilizations and among nondominant groups within contemporary civilizations (Goal 10). Students believed they have developed an appreciation of cultures other than their own and have recognized the impact of ethnocentrism. Perceived competence on this goal increased with semester standing ($r=.21$, $p<.05$). Semesters spent at the University also had a positive relationship with students' recognition that similarities can solve human problems (Goal 12, $r=.18$, $p<.05$).

Across Areas

Standardized responses for these goals compared to all other goals indicated that students feel above average achievement on

only three of the goals. Relative to the mean for all goals, students felt more able to identify key social institutions of a culture and identify how these institutions fit within the sociocultural framework (Goal 2, z= .12), appreciate a culture other their own and to recognize the impact of ethnocentrism (Goal 5, z=.57), and understand the contribution of all classes, gender, and racial/ethnic groups on cultural norms (Goal 6, z=.41).

Philosophy and Ethical Analysis

Within Area

Mean responses to goals in this area ranged from 2.36 to 3.72 with a 3.13 overall group mean. Within this area, students felt least knowledgeable (z=-1.17) about perspectives of the important philosophers on philosophical debates (Goal 1). Relative to rest of the goals, students felt able to examine contemporary issues (Goal 9, z=.92). Student faith in their ability to analyze fundamental epistemological concepts seems to increase with semester standing (r=.20, p<05).

Across Areas

Philosophy and Ethical Analysis had the lowest rated goal compared to the mean of all goal responses pooled from all areas. Compared to the overall average for all goals, students feel least confident in their understanding of the perspectives of major philosophers on philosophical debates (z =-1.69). Students in this area responded above average in only their ability to examine in detail one or more contemporary issues concerning various social and personal beliefs (Goal 9, z=.40). Students in this area rate their competence in their ability to analyze fundamental ethical concepts (Goal 5, z=.00) and just about equal in their ability to grasp the concepts of logic, deduction, validity, proof and fallacies (Goal 8, z=.04) as students generally feel on goals across all areas.

Social Science and Comparative Analysis

Within Area

This area had the highest overall within group mean (3.57). Individual goal means ranged from 3.07 to 4.11. Compared to the other goals in this area, students felt least able to identify criteria for empirically testing hypotheses derived from social science theories (z=-1.16). They felt much more able to identify and critique myths and stereotypes about human nature (Goal 10, z=1.00). Semester standing was positively correlated with their confidence in analytical thinking (Goal 4, r=.31, p<.01). Although the correlation between semester standing and ability to recognize propositions of a theory is positive (r=.18, p<.05), students still rated their ability on this goal (Goal 5) to lower than their average ability on all other goals (z=-.66).

Across Areas

Students' self-efficacy ratings on goals in this area are fairly strong relative to the overall average goal rating. Nine of the 13 standardized scores for responses to goals in this area fall above the average rating for the combined goal responses. This indicates that students in this area feel better about their ability to meet the goals relative to other goals in the general education curriculum. However, they feel less confident in their ability to detect empirically identifiable propositions of a theory (Goal 5, z=-.27), and in the related goals of understanding how to identify the criteria for empirically testing hypotheses derived from social science theories (Goal 6, z=-.60) and evaluating social science theories through comparative analysis (Goal 11, z=-.39).

Science and Technology

Within Area

Science and Technology goal means for the area's 15 goals fell between 3.03 - 4.27. The overall mean was 3.42. Students surveyed for this area indicated a below average competence in scientific model building (Goal 5, z=-.58). They felt better, however, with their knowledge of the nature of the scientific process (Goal 8, z=1.24). Semester standing had no effect on student evaluations of their abilities in achieving any of the goals.

Across Areas

Students felt fairly competent in this area relative to overall competence of all areas combined. Seven of the 15 across area standardized scores for this area fall above the overall score. Their confidence in their ability to distinguish fact from fiction (Goal 1, z=.77) and demonstrate an understanding that science is a continuous process (Goal 8, z=1.24) surpasses the average confidence of students in meeting their goals. These seem to be the only two noteworthy scores for this area.

Conclusions

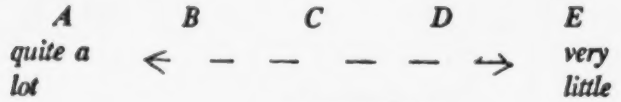
Two broad conclusions may be drawn from these findings. First, students have generally positive views of their skills in the individual areas. In the social cognitive view, the findings suggest that students are likely to approach that content rather than avoid it in the future. Second, the goal statements showing the lowest self-efficacy scores need careful analysis of several alternate hypotheses. For example it may indicate that these goal statements reflect higher expectations or more complex behaviors; lower scores may imply that the curriculum addressing those goals need adjustment; and/or respondents may not understand the meaning of those goal statements, so scores reflect more confusion than accurate self-appraisal.

STUDENT SURVEY
GENERAL EDUCATION

Your assistance is essential in helping us evaluate the instructional program of the university. Your responses are anonymous and will be aggregated so that no individual can be identified.

Semester standing _____ Are you male ___ or female ___?
Age _____ Major _____
Are you planning to do graduate work? yes ___ no ___ maybe ___

How much competence do you think you have in each of the following?



COMPETENCE

A B C D E 1. Know the basic grammatical structures of the target language and use the essentials of the language's sound system in speaking and listening.

A B C D E 2. In the modern languages, acquire an active vocabulary of approximately 1,500 lexical units and passive recognition of approximately 3,000 more.

A B C D E 3. In modern languages, achieve balance development of speaking, listening, reading and writing skills at a novice level ("novice" level means ability to communicate on simple topics and includes a high frequency of grammatical and semantic inaccuracies).

A B C D E 4. In the classic languages, develop reading and writing skills.

A B C D E 5. Learn how the languages may be of future professional and recreational use.

A B C D E 6. Understand the relationship between language and culture.

A B C D E 7. Acquire an inclusive perspective on the target culture(s), one which ranges from artistic accomplishments to details of everyday life.

A B C D E 8. Understand the concept of ethnocentrism and be able to identify its impact on the student's own views and behavior.

A B C D E 9. Appreciate the contributions of women to the target culture.

A B C D E 10. Appreciate the contributions of minority or marginal populations to the target culture.

A B C D E 11. Understand the value system and characteristic socio-political institutions of the target culture(s) which may be based, for example, on gender, race, class, ethnic origin or religion.

A B C D E 12. Understand the interaction between the foreign culture and the student's own in such areas as literature, art, music, philosophy, history and the sciences.

A B C D E 13. Demonstrate awareness of the intellectual training provided by the learning of a foreign language above and beyond the language's practical usefulness.

In the following tables, scale mean values represent mean student evaluations of their competence at the skills specified in the goals listed. A score of 1 indicates little competence and 5 indicates a lot of competence.

Z-score across areas is the standardized score based on the mean of all responses across all six areas.

Z-score with area is the standardized score based on the mean responses to the goals of the specified area.

Correlations are Pearson product moment correlations between scale scores and semester standing.

(*) represents statistical significance at less than .05.
(**) represents statistical significance at less than .01.

Table 8.1

Self Efficacy Results: Foreign Languages

(Number of students = 117)

	Scale Mean	Z-Score Across Areas	Z-Score Within Area	Correlation
1.Know the basic grammatical structures of the target language and use the essentials of the language's sound system in speaking and listening.	3.80	.53	.47	-.22*
2.Acquire an active vocabulary of approximately 1,500 lexical units and passive recognition of approximately 3,000 more.	3.36	-.15	-.14	-.11
3.Achieve balanced development of speaking, listening, reading and writing skills at the novice level ("novice" level means ability to communicate on simple, concrete topics and includes a high frequency of grammatical and semantic inaccuracies).	3.45	-.01	-.01	-.07
4.In the classic languages, develop reading writing skills.	2.86	-.93	-.82	-.03
5.Learn how the languages may be of future or recreational use.	3.51	.08	.07	-.02
6.Understand the relationship between language and culture.	3.85	.60	.54	-.01
7.Acquire an inclusive perspective on the target culture, one which ranges from artistic accomplishments to details of everyday life.	3.25	-.32	-.28	-.01
8.Understand the concept of ethnocentrism and be able to identify its impact on the student's views and behavior.	3.84	.59	.53	.06
9.Appreciate the contributions of women to the target culture.	3.69	.35	.31	-.09
10.Appreciate the contributions of minority or marginal populations to the target culture.	3.42	-.06	-.05	-.08
11.Understand the value system and characteristic socio-political institutions of the target culture which may be based, for example, on race, class, gender, ethnic origin or religion.	3.44	-.03	-.03	.13

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	Scale Mean	Z-Score Across Areas	Z-Score Within Area	Correl-ation
12.Understand the interaction between the foreign culture and the student's own in such areas as literature,art, music, philosophy, history and the sciences.	3.37	-.14	-.12	-.04
13.Demonstrate awareness of the intellectual training provided by the learning of a foreign language above and beyond the language's practical usefulness.	3.18	-.43	-.38	.05

Table 8.2

Self Efficacy Results: Literature and the Arts

(Number of students = 123)

	Scale Mean	Z-Score Across Areas	Z-Score Within Area	Correlation
1.Demonstrate visual and aural concentration as well as ability to assimilate information through a variety of artistic media.	-.31	-.24	.31	.02
2.Demonstrate capacity for critical thinking and analysis in the visual arts (i.e.explore interdependence of content and configuration) as well as in literature, drama, and music (i.e. explore the interrelationship of content, form and style).	3.27	-.29	.26	-.15
3.Demonstrate mastery of a restricted and coherent body of material, as well as an awareness of broader applications of the methodology.	3.08	-.59	-.02	.04
4.Recognize social,religious,cultural, economic and other values expressed in literature and art.	3.44	-.03	.50	-.01
5.Understand the relationship between an accepted canon and anti-canonical values both in art and society.	2.75	-1.10	-.49	-.06
6.Understand how literary and artistic criticism have changed over time, and how these changes have been related to social, political, philosophical and other changes.	3.20	-.39	.16	-.22**
7.Demonstrate a conceptual basis in literature and the arts that provides entry into the discipline.	3.16	-.46	.10	-.18*
8.Demonstrate the rudiments of a specialized vocabulary that will enable the student to move from description to analysis and to articulate critical judgments.	3.17	-.45	.11	-.04
9.Be familiar with representative works by women authors and artists.	2.63	-1.28	-.66	-.17
10.Be familiar with representative works by Black,Hispanic, Asian and other racial/ethnic authors and artists.	2.47	-1.53	-.89	-.18*

	Scale Mean	Z-Score Across Areas	Z-Score Within Area	Correl-ation
11.Be familiar with a variety of non-western as well as western art forms.	2.81	-1.00	-.40	-.10
12.Demonstrate sensitivity to the differing expressive potential of forms and words as vehicles for communication.	3.28	-.28	.27	-.06
13.View literature and the arts as integral to all human life and society, and not merely as the special interest of artists of an elite few.	3.73	.42	.92	.09

Table 8.3

Self Efficacy Results: Culture and Modern Society

(Number of students = 124)

	Scale Mean Areas	Z-Score Across Area	Z-Score Within	Correl-ation
1.Understand the nature of civilization and its development, in particular the place of the arts,music and literature, engineering and other applied sciences, and agriculture, commerce and other means of subsistence within the general framework of civilization.	3.14	-.50	-.15	.16
2.Identify the key social institutions of a culture, and describe how they fit within the framework of the total sociocultural system. Key social institutions are: economics and social class; friendship; marriage, family and kinship; governance and social control; religion, world view and aesthetics.	3.54	.12	.58	.10
3.Have an inclusive perspective on the cultures and societies studied, recognizing not only accomplishments of elites but the skills and contributions of all classes and social groups.	3.25	-.32	.05	.14
4.Identify aspects of contemporary American civilization whose origins are traceable to the civilizations of the Ancient world, the Middle Ages, and Modern Europe and those drawn from other civilizations (Native American, African, Asian etc.)	2.98	-.75	-.44	.07
5.Develop an appreciation of cultures other than one's own and recognize the impact of ethnocentrism.	3.83	.57	1.11	.21*
6.Understand the contributions of all classes, gender, racial, ethnic, and social groups to the change and persistence of social and cultural norms over time.	3.73	.41	.93	.16
7.Describe the contributions of all classes, gender, racial, ethnic, and social groups to the historical development of the arts, sciences, and/or the professions.	3.19	-.42	-.06	.12
8.Understand the dynamics of the relationship between a culture and its physical environment.	3.44	-.03	.41	.15
9.Identify and compare specific institutions and aspects of Euro-american civilization that are historically distinctive and some that are held in common with other civilizations.	2.74	-1.11	-.87	-.00

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	Scale Mean Areas	Z-Score Across Area	Z-Score Within	Correl-ation
10. Identify the historical origins of the conditions which prevail among non Euro-american civilizations and among non-dominant groups within contemporary civilization.	2.58	-1.35	-1.16	.05
11. Compare specific characteristics (e.g., professions, institutions) of Euro-american societies with those same characteristics in other societies.	2.80	-1.02	-.77	-.06
12. Understand that similarities among cultures can make solutions to some pressing human problems possible and illustrate how differences between cultures may make universal solutions to some human problems possible.	3.41	-.08	.35	.18*

Table 8.4

Self Efficacy Results:Philosophy and Ethical Analysis

(Number of students = 118)

	Scale Mean	Z-Score Across Areas	Z-Score Within Area	Correl-ation
1.Know the significant ideas and debates in philosophy through an analysis of the works of important philosophers.	2.36	-1.69	-1.17	.07
2.Understand how arguments are constructed and how they may be evaluated.	3.36	-.16	.36	.01
3.Be familiar with the role of analysis in the formulation, clarification, and acceptance or rejection of a thesis.	3.15	-.48	.04	.11
4.Express and defend theses relevant to philosophical issues.	2.74	-1.11	-.59	.15
5.Analyze fundamental ethical concepts such as "good", "right", "duty", "moral responsibility", and "blame".	3.46	.00	.52	-.02
6.Identify ethical dimensions of human choice, in contrast to practical, technological, legal, empirical and other dimensions.	3.14	-.50	.02	.05
7.Analyze fundamental epistemological concepts such as "knowledge", "evidence", "defensibility", "introduction", and "verification".	2.84	-.96	-.43	.20*
8.Have a grasp of logic, deduction, validity, proof, and fallacies.	3.48	.04	.56	.13
9.Examine in detail one or more contemporary issues concerning justice, gender, self, language, human relations, discrimination, sciences, reality,professional obligations, and religious beliefs.	3.72	.40	.92	.03
10.Learn the role general philosophical principles play in the examination of contemporary issues.	2.97	-.75	-.22	.09
11.Have a grasp of the various ways in which logic, ethical, predictive, explanatory,and other kinds of propositions can be supported.	3.18	-.44	.09	.18

Table 8.5
Self Efficacy Results: Social Science and Comparative Analysis
(Number of students = 115)

	Scale Mean	Z-Score Across Areas	Z-Score Within Area	Correlation
1.Understand how relationships (economic, political, social, spatial) develop, persist, and change between individuals and groups or between societies.	3.55	.14	-.05	.14
2.Differentiate patterns and structures of social systems and institutions.	3.34	-.19	-.54	.14
3.Identify the impact of various social institutions and practices groups in society; e.g. women, minorities, the poor.	3.69	.35	.27	-.02
4.Have a basic understanding of how to think analytically, and recognize abstract patterns.	3.61	.23	.09	.31**
5.Have a basic understanding of how to recognize propositions of a theory which are empirically verifiable.	3.29	-.27	-.66	.18*
6.Have a basic understanding of how to identify the criteria for empirically testing hypotheses derived from social science theories.	3.07	-.60	-1.16	.09
7.Understand the limits of generalizability for specific findings.	3.49	.04	-.19	.17
8.Understand how individuals are socialized as members of groups and societies; i.e., families, informal groups, organizations, cultures.	3.96	.76	.90	.02
9.Understand the ways in which individuals, both alone and collectively, change the groups and societies in which they live.	3.78	.50	.49	-.05
10.Identify and critique myths and stereotypes about human nature; e.g., class differences, male/female differences, racial differences.	4.11	1.00	1.26	.06
11.Evaluate Western social science theories and perspectives about human behavior through comparative analysis.	3.21	-.39	-.84	.14

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	Scale Mean	Z-Score Across Areas	Z-Score Within Area	Correl-ation
12.Recognize how social science knowledge can assist in understanding social issues (e.g. racism, poverty) and human interaction patterns (e.g. childrearing, male-female relations).	3.74	.43	.39	-.06
13.Recognize the permeating role of political and economic systems in society.	3.52	.09	-.11	-.05

Table 8.6

Self Efficacy Results: Science and Technology

(Number of students = 124)

	Scale Mean	Z-Score Across Areas	Z-Score Within Area	Correlation
1.Distinguish facts from interpretation.	3.96	.77	.81	.14
2.Describe the scientific method, including the criteria for verification and falsification of scientific ideas.	3.29	-.26	-.19	-.07
3.Describe the limitations of the scientific method in developing and expanding knowledge.	3.13	-.51	-.43	.14
4.Understand how imperfections in theory influence generalization and interpretation of scientific ideas.	3.39	-.11	-.04	.11
5.Describe the importance and limitations of model building in scientific inquiry.	3.03	-.66	-.58	.15
6.Comprehend and express information (including numeric and graphic material) related to scientific and technological aspects of a culture.	3.38	-.12	-.06	.11
7.Understand the importance of quantification and statistical analysis in describing events and in making generalization and predictions about those events.	3.48	.02	.08	.12
8.Demonstrate an understanding that science is a continuous process; i.e., knowledge succeeds from the past, and will be revised in the future.	4.27	1.24	1.26	.16
9.Acquire a basic knowledge of at least one scientific or engineering discipline.	3.51	.07	.13	.07
10.Distinguish concepts derived from scientific and unscientific means.	3.52	.10	.16	.01
11.Evaluate the opinions of technological experts in public forms.	3.08	-.58	-.51	-.03
12.Merge scientific or engineering data with political, economic, ecological, social, and ethical issues to define and debate problem solutions.	3.08	-.58	-.51	.02

	Scale Mean	Z-Score Across Areas	Z-Score Within Area	Correl-ation
13.Consider the appropriateness of scientific values (e.g., objectivity) in making social and ethical decisions.	3.52	.09	.15	.00
14.Appreciate that science and technology involve many disciplines and be conversant with information characteristics of more than one of these disciplines.	3.47	.01	.07	.09
15.Describe the differences and relationships between basic science information and its technological implications.	3.26	-.30	-.23	.07

APPENDIX 9

SUMMARY REPORTS USED FOR DISSEMINATION

"But How Do We Know It'll Work?"

An assessment memoir.

by Barbara D. Wright

In May of 1988, the University of Connecticut received a grant from the Fund for the Improvement of Postsecondary Education (FIPSE) for a three-year project to assess its new general-education curriculum. For the next eighteen months I served as project director, until my departure for AAHE. The funding not only allowed us to carry out the project; it also profoundly changed my thinking about assessment.

At the outset, we conceived of our job as data collection and analysis, and the project's still working hard on that. But by the time I left, before any data had been collected, I'd come to believe that the greater value of the whole effort lies in the *conversations* about general education that it provoked. That sea change in my understanding of assessment is what this little memoir is all about.

The story begins on a balmy spring day in 1986, when the University of Connecticut's faculty senate voted to accept a new general-education curriculum to be required of all entering students beginning in September 1988. As a collective sigh of relief passed through the meeting room—even those who were unhappy with the curriculum had reached a point of exhaustion—a brave skeptic rose and asked, "But how do we know it'll work?" He then moved the creation of an *ad hoc* committee charged to evaluate the curriculum, plot its effects, and eventually make recommendations. The motion passed.

Recommendations for what? For improvement of the curriculum? For its abolition? That was never entirely spelled out. And so assessment was launched at UConn into the mists of ambiguity. At least our fate was in our own hands; in contrast to assessment projects elsewhere, which were initiated by a legislature, governing board, or by administrators, assessment at UConn began and has remained entirely a faculty affair. That's not to say the project has been spared political overtones. But it's been family politics. And more often the target of political maneuvering has been the curriculum itself rather than its assessment.

The "evaluation committee" (which in its innocence didn't even learn the "A" word for what it was trying to do until more than a year later) decided early on that its first task was to define specific student outcomes for each of the six cognitive areas of the curriculum. Subcommittees produced "goal statements," which were widely circulated and went through several revisions. Through 1987-1988, the committee reviewed the literature on assessment, consulted with testing companies, talked strategies for assessing the curriculum, looked for outside money, and made complete, periodic reports to the Senate. No one much noticed.

What was this curriculum on which the committee lavished so much attention? Like many other schools, UConn adopted a structured menu. It consists of six cognitive areas: foreign language, literature and the arts, Western/non-Western civilization, philosophy and ethics, social science, and science and technology; and it includes writing, quantifying, and computing requirements. Students fulfill their general-education requirements by choosing courses in each of these categories.

But for a lot of UConn faculty, the "new" curriculum was actually a disappointing case of déjà vu: a slightly modified version of the requirements that had been in effect in the College of Liberal Arts and Sciences (CLAS) since 1979. So the recycled curriculum brought with it the baggage of unresolved conflicts and dubious compromises. Moreover, courses from the old CLAS curriculum were to be grandfathered into the "new" curriculum with no review, meaning that the majority of offerings in each category would not be scrutinized for alignment with Senate guidelines or our committee's student goals.

There were plenty of other problems, too, problems hardly unique to UConn. There was general lack of "ownership" of the general-education curriculum, except to the extent that liberal arts departments saw it as a path to additional faculty and resources. Even as they jockeyed for students, the departments disdained a mere "service" role. UConn's new ambition to become a "top-twenty" research university seemed in direct conflict with the demands of general education, which implies a commitment to undergraduates. The "poor relation" status of general education was reinforced by a lack of financial or even moral support from academic affairs—or so it seemed to faculty.

Into this sea of competing agendas and general dispirit sailed the FIPSE project, full of optimism and energy and fueled by a bit of money. A $150,000 grant was fairly big news on the Storrs campus, given the committee's

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Faculty embarked on the project with seriousness, good will, and curiosity—as well as outspoken skepticism that the job could be done at all. The latter didn't bother me; I wasn't entirely convinced about the value of assessment, either.

obscurity up to then. Despite warnings that long hours and hard work would be involved, the project succeeded in recruiting a cadre of highly respected faculty with reputations for solid research and fine teaching. In return for their efforts, we offered them an intellectually interesting task, an opportunity for professional development, and a modest stipend.

The faculty were organized into six teams, corresponding to the categories of the curriculum, and they set to work reviewing course syllabi, exams, and available instruments; and devising a strategy to assess their area of the curriculum. If the team decided to fashion its own instruments, they would be developed that spring and field-tested during 1989-1990.

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In the composition of the six teams, the project aimed for a mix of specialists and generalists, within-field and out, enthusiasts and the unconvinced, simply because this sort of "balance" seemed sensible. We also tried to appoint as team chairs people who did not come from the dominant department in a given area. This policy of mixing viewpoints and sharing power turned out to be even more important than we thought at the outset. As the project progressed, we discovered how essential it was in the assessment process to question old assumptions and habits of thought (especially disciplinary isolation and chauvinism). The most heterogeneous teams proved the most flexible, produced the most creative instruments, and seemed most exhilarated by the intellectual exchange with newfound colleagues.

The process was an eye-opener, startling even, for many faculty participants. First, they learned they were to look at courses in their category in relation to a set of "student goals" that they barely knew existed. Second, they were supposed to look for "commonalities" *across* the courses within a given category—a daunting task for people who had seldom thought beyond the unit of the individual course. It was news enough to realize that there were even supposed to *be* these connections, never mind finding and describing them, then building an assessment instrument around them.

Problems arose: with the goals, with the ways we would examine for them, and with the results that faculty anticipated. Getting clear about the specific content of the goals was only the first problem; then the teams had to reach some consensus that the goals were generally acceptable, and figure out how "appreciation" and "understanding" could be *demonstrated*. Finally, there was the temptation to bolt when it turned out one hadn't really been teaching these things at all. And there remained those principled souls, primarily in the humanities, who objected to the very idea of goals because, they believed, goals would inevitably trivialize the complex and ineffable things we taught.

The discrepancy between the new goals for general education and departmental practice could be pretty stark. The natural scientists, for example, realized they taught a lot of facts but much less about general principles of scientific thought and nearly nothing about the impact of science on society. The foreign language goals placed a strong emphasis on oral communication and cultural sensitivity—a reflection of the interests of faculty in the school of business, for example—while language faculty preferred to train students to read and analyze literature.

Then there was the issue of instruments. What format (i.e., multiple-choice, true/false, open-ended, essay) should be used? What signal would a particular format send to students about our educational values? And what about content? Should the instrument include generic intellectual skills, or discipline-based knowledge, or both? In what proportions? The commercially available instruments turned out to be either too generic for us (for example, the ACT COMP or the Academic Profile), or too discipline-specific (the GRE). By making up our own instruments, we hoped to get something tailored to our specific curriculum. But faculty design of the instruments also led to one additional and significant benefit over outside purchase: the work involved everyone far more deeply in discussion of the curriculum itself.

Faculty began to talk about the fact that the aims of a general-education course were perhaps different from, say, an introductory course for a prospective major. Or that what mattered for general education was perhaps less the facts regurgitated on the final exam than what students would still have with them five or ten years down the road, indeed, for the rest of their lives—the will and intellectual discipline, for example, to grapple with ethical problems. The assessment project forced such questions about the curriculum to the surface; for those faculty who taught gen-ed courses, the activity became a kind of examination of conscience.

Many faculty on the project became nervous about the Pandora's box we appeared to be opening. A frequent line of argument, as instruments were being developed, was: I know this is in the goals, but do we have to include it? ("it" being any number of difficult things: critical thinking, cultural sensitivity, and so on). My answer was always yes, it's in the goals, so let's look for the evidence. The next objection was: But we don't teach this. But that, it became more and more apparent

In my view, there is nothing wrong with assessment "driving the curriculum," if we are driven toward worthwhile goals that we agree we ought to be achieving anyway. The trick is to make sure that all important goals are built in.

to us all, was precisely the point of the project: to figure out what we *should* be teaching, and then do it. The unspoken fear, of course, is that if "we don't teach this," students will do poorly and the department will look bad. An assessment project needs policies for the *use* of results, to protect individuals and departments and leave them free to identify problems without fear of punishment.

It's often noted that the campuses where assessment has been most powerful and effective—places like Alverno and King's College—tend to be smaller and have a clearly defined teaching mission. Common wisdom has it that research universities, on the other hand, offer distinctly uncongenial environments for assessment. Certainly many things at a comprehensive university do work that way: the low status of undergraduate teaching, the lack of monetary or even symbolic rewards for engagement with problems of student learning, the orphan status of general education. And there's the ease with which sophisticated researchers can fault any instrument or research design. A large, decentralized campus and poor communication don't help.

Fortunately, the UConn committee had no idea when it started that assessment was supposed to be difficult or impossible on such a campus. On the contrary, we found that some characteristics of our university worked *for* assessment. It was possible, in a place as large as UConn, to find many individuals with strong research interests *and* a genuine concern for teaching and learning; people who hungered for a project that legitimized their concern for students. The project provided things that they missed on campus, like reinforcement of the value of teaching and the pleasure of making friends with people from other corners of the campus. There was the uniqueness of being on a committee that talked about education for a change, instead of about the failings of the academic calendar or the number of parking spaces devoured by the new sports pavilion.

A year and a half into the project, a significant number of faculty participants still express skepticism about the value of assessment and its ability to measure general-education outcomes. I can accept that; skepticism, after all, is the nature of the academic beast. But if that is their "text" on this issue, there is also a "subtext": by the quality of their effort, these faculty have demonstrated a very real commitment to students' education and a hope that their efforts can improve it.

There are other issues that the UConn project evoked, issues by no means unique to the Storrs campus. One of them is the relationship between assessment and change. I heard people on the campus say they didn't want to do assessment because inevitably it *would* be used as a lever to change the curriculum: assessment would "drive the curriculum," and faculty would be pressured to "teach to the test." I also heard assessment used as an excuse for why we *couldn't* change the curriculum: with an assessment project in progress, changing the "treatment" in the middle of the experiment would destroy the validity of the instruments and render any longitudinal data meaningless.

The common denominator here seems to be that people resist change. But what *should* be the relationship between assessment and change?

In my view, there is nothing wrong with assessment "driving the curriculum," if we are driven toward worthwhile goals that we agree we ought to be achieving anyway. The trick is to make sure that *all* important goals are built in, and a range of assessment methods are used, so that stated goals are not achieved at the cost of more important and complex but unstated ones. Second, it seems to me that under no circumstances may assessment be allowed to become reified, a purpose unto itself with no connection to the larger campus environment. A campus (unlike a scientific laboratory) must change in response to new pressures and needs. For example, there have been calls on the Storrs campus to add a new "diversity" requirement to the gen-ed curriculum, and there have been objections to this modification—among them that it'll ruin the assessment project. But assessment should serve the campus, not control it; to use assessment in any other way becomes perverse.

The problem here is accepting contingency . . . the contingency of a particular curriculum, or set of goals, or a particular instrument or method. All these things, to me, are working hypotheses, not ultimate definitions of "truth." In Lee Knefelkamp's phrase, we're dealing here with the difference between "the truth" and "truthfulness." We know very well, in the rest of our professional lives, that we'll never approach "the truth," but still we strive mightily to be "truthful" in our research and teaching. It's easy to turn the imperfections of a curriculum or a set of goals into an excuse for not even trying to assess. Nevertheless, we *can* work with them, just as inquiry in any discipline proceeds largely from hypotheses and theories, not proven laws. If we can accept this in our own research, why not in assessment?

There's an even bigger "change" question now lurking in the wings, one raised by the project's FIPSE program officer. After a visit to campus, she wondered whether our work in assessment would be a mere "blip on the screen" or lead to real change in the "campus culture." My God, I thought in a panic, as I read her letter, is *that* what we're supposed to do? *Change the campus culture?* Our ambitions had been far more modest. But

I truly didn't know what we were getting into three years ago; the power of assessment's questions, their bedrock fundamentalness, has dawned on me only gradually.

on second thought, this is not a bad way to look at assessment.

"Changing the campus culture" suggests that assessment is ultimately not data collection or reports to authorities but an attitude: one that includes listening to students, examining our own teaching, and rededicating ourselves as a campus to improvement of undergraduate education. Obviously, assessment can't do this single-handedly, but it can help: it puts the right questions on the table. In Storrs, there are people who have been putting serious work into assessment for more than three years now. About seventy-five faculty members have worked on the project, either as team members or as reviewers of instruments, and hundreds more have heard o' our work. Maybe someday we *will* look back and say we helped transform the campus culture.

Eighteen months into the project, the six teams are on track and on schedule. There are instruments for five out of six areas of the curriculum, with the last set nearing completion. Most of the instruments have already been pilot-tested on incoming and exiting students. The project is finding out not only how well students perform in these exercises but also what they think of the assessment process. Often, in writing or in conversation, the students turn from the assessment to reflect on the education they've received so far—and that's all to the good.

At this point in the project, the questions we began with—"Is the curriculum working? Is it better than what we had before?"—seem a little naive. We have different questions now: Are students able to gather, evaluate, and synthesize information? Do they have the literacy and numeracy skills they should? Can they recognize the rationale behind a philosophical position, even when they don't personally hold it? Are they capable of aesthetic response to a painting or a poem or a piece of music? Do they see connections among the courses they take in general education, or between their general education and their major field of study? And what, exactly, do the faculty do in their courses to foster these abilities, these habits of mind and spirit?

These are the sorts of questions that occupy the project now. They can't possibly be answered in relation to the old curriculum because we never even *asked* them of the old curriculum. "Does it work?" was a good and necessary starting point, but we had to go beyond it.

I truly didn't know what we were getting into three years ago; the power of assessment's questions, their bedrock fundamentalness, has dawned on me only gradually. For me and others, the project became a journey of personal and intellectual exploration at the misty fringes of what we know about education—intensely personal, unsettling, difficult. Not all of us feel comfortable with this sort of thing, and it's sometimes tempting to just turn and run. Indeed, the project seems to have pushed at least one faculty member I know closer to early retirement.

I sympathize, but this discomfort is not unique to assessment and it shouldn't bog us down. Almost ten years ago, the eminent feminist scholar Peggy McIntosh published an article called "Warning: The New Scholarship on Women May Be Hazardous to Your Ego." She noticed that even the most well-intentioned faculty often reacted defensively to the suggestion that, say, a reading list of all-white, all-male authors was "unbalanced"; after all, these academics had put years of effort into producing the best scholarship and teaching they could—and now women's studies was telling them that their work, because it overlooked half the human race, was fundamentally flawed. Once she said it, of course, the problem was utterly obvious. And yet somehow, they'd never noticed. It was the perfect moment for denial and retreat.

Assessment is a little like that. We've invested vast amounts of time and effort in our teaching—happily or grudgingly as the case may be—and then assessment comes along and asks us a set of truly fundamental questions about teaching that we've never even bothered to deal with. Suddenly a raking light is cast over the work of an entire career. It's devastating, or can be. But realizations like that aren't the end of the world, any more than they were in women's studies. After the initial shock, there are wonderful opportunities for new thinking, experimentation, renewal, growth. If we want our students to grow, surely we owe it to them to keep on growing ourselves.

At the risk of turning this little essay into a homily, it strikes me that ultimately, perhaps, for both faculty and students, assessment is the embodiment of humility, honesty, and democracy in academe. If we want students to admit candidly the limits of their own knowledge and work to expand them, we must find the courage to do likewise. If we expect students to engage the ideas of others, we must show that same respect and seriousness. If we want students to learn from us, we must be willing, in a spirit of equity, to learn from them and from their assessments of us.

The question "How do we know it'll work?" can be asked not only of a curriculum but of assessment itself. The answer is that we don't know whether it'll work. That depends, as Pat Hutchings and Ted Marchese are wont to say, not on assessment itself but on the people who carry it out. I agree with that; I would only add my own corollary: "Given the right people, it may very well work—in ways utterly different from what you expected when you started." ■

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ASSESSMENT OF GENERAL EDUCATION PROJECT

This report provides some brief background information on the University of Connecticut's Assessment of General Education Project. It summarizes the activity of the second year of the project, and outlines the proposed activity for the project's third and final year.

OVERVIEW

The UConn project consists of assessment in six general education goal areas: Science and Technology, Foreign Languages, Culture and Modern Society, Social Science and Comparative Analysis, Philosophical and Ethical Analysis, and Literature and the Arts. Within each area, students are required to take certain general education courses, or to select from a menu of courses in a particular area. The project aims at providing some information on the following research questions:

1. **Does the level of performance in these general education areas improve with increasing time in the University?**

2. **Does the number of courses taken in a general education area predict improved performance in that area?**

3. **Do the faculty involved in general education courses agree with the goal statements for that area?**

4. **Do students feel that general education provides them with benefits?**

In each goal area, a faculty committee has been charged with creating and revising appropriate test instruments. The basic research design originally proposed for this project calls for comparing incoming with exiting students on performance in the goal areas, and comparing exiting students who have taken more courses within each area with students who have taken fewer. This design addresses research questions 1 & 2.

Research questions 3 & 4 represent an expansion of the original project, and are the result of experience gained during the first and second year of this project. It has become increasingly clear that faculty acceptance of the assessment process is critical. The primary precondition for this acceptance (necessary, but not sufficient) is agreement with the goals of general education. Thus research question 3 was added.

Research question 4 grew from informal student comments about the testing process and the general education curriculum. To adequately assess the impact of general education, it is necessary to look beyond pure performance measures. Two general areas of student subjective response have been added to the project: student feelings about the costs (such as curriculum rigidity, lack of "relevance" of courses) and benefits (broader understanding, preparation for the future) of general education; and self-perceptions of ability to know or perform within the areas represented by the general education curriculum.

The project is funded by a grant from the Fund for Improvement of Post Secondary Education (FIPSE) and the University of Connecticut Provost's Office. The project director for the first 18 months of the project was Barbara Wright (Modern and Classical Languages); during the final 18 months of the project the director will be James Watt (Communication Sciences).

REPORT ON ACTIVITIES AND FINDINGS OF THE FIRST TWO YEAR S

First year activities are summarized in the accompanying article by Barbara Wright.

Much of the activity in the second year centered around the first cycle of data collection (1148 incoming Freshman and 342 Juniors and Seniors were tested), and the revision of the test forms. The results of this activity will be discussed in terms of their bearing on the research questions.

Analyses addressing each of the four research questions have been carried out. These analyses are based on pilot data, or are at a preliminary stage of analysis. They have two purposes: pilot testing of data handling and analytical procedures, as a preparation for the third year's more rigorous data collection activities; and as a "first-pass" view of the data, for generating additional analytical questions.

The results presented here must be qualified as *very* preliminary in nature. Some, like the advanced student responses to the performance instruments in the six goal areas, are based on small numbers of respondents; some of these performance instruments have since been revised to improve their reliability and validity, and thus will not be used in the final data collection. In the student self-efficacy study, not all data have been entered into the analysis, nor have complete analyses which detail student responses to particular specific goals been conducted. Likewise, the student focus group data has not been completely analyzed for its full richness.

The analyses should be viewed as indicative of the kinds of analyses which will be conducted in the final stages of this project. They illustrate the ways in which we will attempt to answer the research questions, rather than providing an answer to the research questions. It may be legitimate to draw some tentative conclusions from the entire pattern of results, but it is definitely not valid to interpret a single statistic or table entry.

1. Does the level of performance in these general education areas improve with increasing time in the University?

With the exception of the Cornell Z test (the only standardized test used in any of the goal area groups), instruments used in this first round of tests were the original, unrevised drafts and contain some items found by committee members to be invalid or unreliable. These results are thus "noisy" and should be viewed with caution.

Overall mean performance scores increased from incoming Freshmen to advanced students in all but one of the measurment instruments. Because of the small numbers of advanced students tested with any single instrument, none of these individual results reach conventional levels of statistical significance. However, it is extremely unlikely that this overall pattern of positive change occurred by chance alone. (In fact, the odds are less than 1000 to 1 that all changes in the locally prepared instruments should have been in the positive direction, if there were no actual performance gains).

We thus have some tentative support for concluding that there are increasing levels of performance in the general education goal areas. These improvements occur between the time the student enters the University and the time he/she approaches exit. However, this result could be due to increased maturity, general life experience, or some other maturational explanation. The following research question addresses this effect more clearly.

2. Does the number of courses taken in a general education area predict improved performance in that area?

This is a critical question in the evaluation of the general education curriculum. It cannot be answered with any great degree of confidence using this preliminary data.

The pilot analysis combined some information from student records with the data obtained from advanced students. Student SAT scores at University entry, current semester standing, and grade points obtained in general education courses in each of the goal areas were obtained for each of the students.

To isolate the effect of general education courses from alternative explanations for student performance, three general explanations for student performance were considered: individual abilities; general maturation and experience; and academic courses taken. Individual abilities were

represented by student SAT scores. Maturation and experience were represented by the student's semester standing. Coursework was represented by the student's grade points in each goal area.

These three blocks of variables were introduced in a hierarchical multiple regression. Because of the small numbers of students, very few of the individual coefficients were statistically significant. Again, interpretation must be confined to a qualitative assessment of the pattern of results, not to any single finding.

Even with this caveat, some general patterns do emerge from this analysis. Individual abilities (represented by SAT scores) do predict much of the variance in performance. This is not a revelation, but it does provide some basic assurance of the overall low-level validity of the performance tests: students who had better abilities as high school seniors do better on the tests.

For the most part, maturity and experience, as represented by semester standing, accounts for only a very small part of the variance in performance. This finding is circumstantial evidence that at least some of the performance gain is due to coursework, and not to general maturity processes.

The amount of student coursework and the level of performance in these courses within the individual goal areas does not seem particularly predictive of performance on the assessment instrument in the same goal area. This would seem to argue against the effectiveness of the courses in the general education curriculum, and to contradict the conclusions drawn from the previous comparison between incoming Freshmen and advanced students which found tentative evidence of performance gains. But examining the effect of ALL general education courses taken by a student on performance provides a different picture: there appears to be some modest effect produced by the cumulative number of general education courses in all areas taken by a student, and by the level of student performance in all general education courses.

This is a very interesting finding, if it is substantiated in the data analysis conducted in the final year of the project. It would argue that general education effects are seen *across* goal area boundaries, rather than *within* the course groupings. We may be seeing the synergistic effect of a diverse general education curriculum.

We will be most interested in investigating this finding in the final year of this project.

3. Do the faculty involved in general education courses agree with the goal statements for that area?

During the second year of the project, 676 general education faculty members were surveyed concerning their agreement with the general education goal statements. Fourty-seven percent of the faculty responded. The responses showed strong faculty agreement on the basic goals of general education.

For all seven core areas there were no significant differences due to faculty status or number of times an instructor had taught a general education course.

Overall, it seems that most faculty in all goal areas agree that the previously developed student goals and course guidelines are important irrespective of their status or experience, and they agree to a remarkable degree on the relative importance of each goal.

4. Do students feel that general education provides them with benefits?

Two projects have been conducted to investigate this research question. The first elicited comments from students about their views and opinions concerning general education. The second investigated student perceptions of their own abilities.

Focus group interviewing was conducted to determine student subjective responses to general education. Forty-four Freshmen and Seniors from diverse academic departments participated

in eight focus group discussions led by student moderators trained in this methodology by Leslie Snyder, a Communication Sciences professor who also interpreted the results of the videotaped interviews. Seniors in both Liberal Arts (who had taken a curriculum much like the general education curriculum) and those in the professional schools and colleges (who had not) were recruited. Students openly discussed their impressions of general educaton and experiences with the general education course requirements.

The students accepted the idea of the general education requirements. None of the students advocated their abolition. Students recognized that the goals of the general education requirements are to give them a broad education. Some Freshmen and a few Seniors, though, perceived the requirements as a burden that had to be shouldered if they wished to graduate. More positively, many Seniors reported that they changed their perspective over time, coming to value what they previously endured.

A common student criterion for evaluating the worth of a general education area was its potential application to future work. This opinion was held, despite the general acceptance of the idea that the general education requirement is meant to broaden students' interests and knowledge. Thus, students seem conflicted between the desire for a liberal education and for one that is specialized. A sort of compromise view was that the general education courses can help students decide their major, but once they have chosen a major, they should not be required to take additional general education courses.

At many points in the conversations, students had a hard time separating the concept of general education from the execution of particular courses. When they showed resentment of taking a course in a category they did not value, they tended to choose the course with the reputation of being easiest, but then focused on the fact that they did not think they learned anything. Cheating, foreign teaching assistants with English language problems, and very large lecture sections, while attributes of particular courses, were associated with their opinion of the requirements as a whole.

Overall, the abstract principle of general education was accepted. However, there was much discussion over the value and execution of specific courses in each goal area. In general, skills courses, such as writing and languages, were appreciated. Mathematics was the exception, suffering from a common view that some people cannot handle mathematics, and that the courses are poorly taught. None of the students mentioned the general principles and problem solving procedures that can be learned in math courses. Instead, math skills beyond balancing a checkbook were seen as irrelevant for those in non-technical fields.

Among the other categories, the social sciences and history seemed to be accepted as worthwhile by nearly everyone. In these categories, students wanted more choice of courses, or courses that were taught in a better manner.

There was much more debate about science and literature and art. Both categories were labeled by some students as irrelevant, but both also had their advocates. Some Seniors regretted not paying more attention during these courses, or not having taken them if they were not required. The Seniors expressing the latter sentiment seemed more intellectually curious, and to have an overall appreciation for a broad education, whereas the former admitted to being recent converts to the idea of valuing knowledge for knowledge's sake.

Suggestions about the selection and execution of the courses included: a computer course requirement, improving the English-speaking abilities of foreign teaching assistants, and providing more sections of writing courses. Some of these suggestions have already been implemented or are being addressed by the faculty and administration.

Finally, the change of heart expressed by many Seniors suggests that there may be an opportunity for Seniors to try to create a more receptive attitude toward the general education requirements among incoming Freshmen. One way which they might achieve this is through peer counseling at orientation, when Freshmen are choosing their courses.

Students' perceptions of their own abilities were measured using self-efficacy tests developed by Steven Owen (Educational Psychology) from the goal statements in each of the six areas. Data have been collected from about 300 Freshmen and about 300 Seniors. This data has just been collected and the results are preliminary.

In general, students showed small increases in perceived self-efficacy between their Freshman and Senior years in the majority of goal areas. Most of the interesting analyses, which track the change in self-efficacy through the intermediate stages of the students' academic careers, and those which break down self-efficacy to individual sub-goals within each area, remain to be done.

ACTIVITIES PLANNED FOR YEAR 3

Between June, 1990 and May,1991, we will test about 1500 incoming Freshmen and 600 advanced students. Revised test instruments will be used in most of the goal areas. The student sample for the advanced students will be drawn randomly from student records. Quota sammpling will be used to ensure a sample representative of the student population on semester standing and major. Each upper division student will complete two 50-minute test instruments in a single testing session, giving 1200 instrument responses. The 1500 Freshmen will each complete a single test instrument. Freshmen will not be sampled, but all incoming Freshmen attending the June orientation session will be tested. All students will be tested under controled conditions. This data will be used to obtain more detailed and dependable answers to the research questions.

In Fall, 1990, we also anticipate interviewing three groups of faculty: faculty who teach general education courses; those in departments who teach such courses, but who do not teach them themselves; and faculty from other departments, particularly the professional schools. We will be looking for differential evalu ations of the general education curriculum; awareness of the goals of general education; diffusion of discussion about general education to faculty members not involved in teaching such courses; and differential evaluations of the usefulness of general education.

These groups will serve two purposes: they will provide us with additional information about the faculty view of general education; and they will serve to further stimulate faculty discussion of the general education curriculum. Just as a University-wide colloquium held in Fall, 1989 promoted debate of the general education curriculum, we expect participation in these focus groups to produce "backward diffusion" of discussion to the academic departments.

The student and faculty focus groups will be further analyzed, with a view to identifying areas of agreement and disagreement between faculty and students about the goals and curriculum of general education.

PREPARED BY THE GENERAL EDUCATION EVALUATION PROJECT STAFF.

October, 1990.

SUMMARY OF FINDINGS

UNIVERSITY OF CONNECTICUT

GENERAL EDUCATION ASSESSMENT PROJECT

September, 1991

Project Background

During the 1988-1989 academic year, 50 faculty members served on six General Education Goal Area committees. Each committee created a set of General Education Test Instruments to assess student achievement of general education goals in its area. The six goal areas were:

Foreign Languages

Literature and the Arts

Culture and Modern Society

Philosophy and Ethical Analysis

Social Sciences and Comparative Analysis

Science and Technology

During the 1989-90 academic year, these test instruments were pilot tested and revised by the goal area committees. During the 1990-91 academic year, the final test instruments were used to collect the data from which the results outlined below were obtained.

What follows is a brief summary of the project and its most prominent findings. The full technical report for this project will be available in late October, 1991.

Students Tested

1694 incoming Freshmen were tested during the summer orientation period in 1990. These students were not sampled. They were the majority of incoming Freshmen for the 1990 class. Each student completed one general education assessment test instrument.

585 upper division students were randomly sampled from enrollment records. The resulting sample was proportionally representative of the university student population by college or school and by major. Each student completed two general education assessment test instruments from different general education goal areas during a single 2-hour test session. 1170 test forms were obtained from these students.

Measurements

Basic Abilities: SAT Verbal and SAT Math scores obtained for each student from the student records database were used as indicators of students' basic ability levels before entering the University.

Foreign Language Experience: The number of years of high school foreign language taken was used as an indicator of past experience in foreign languages.

Semester Standing: This was set to 0 for incoming Freshmen, and its value was obtained from student records for upper division students. Semester standing was used as a surrogate indicator of both maturity and general university experience.

Overall Test Score: This was the test score for the student on one of the 17 General Education Assessment Instrument Forms. All scores were converted to a percentage basis. For some analyses, the scores were converted to standard scores (z-scores), based on the mean and standard deviation for each form.

Goal Scores: These were computed from a subset of items on each Assessment Instrument Form. Test items to construct these scores were

identified by the General Education Goal Area committee which constructed the forms as being indicators of achievement on one or more of the General Education goals for the Area covered by the test form. These scores were also converted to percentages and z-scores.

Course Experience and Performance in General Education: For each student, grade records were examined, and the grades and credits for all courses which fulfilled general education requirements were used. Grade points for all courses were summed to give an overall grade point value for all courses taken in the General Education curriculum. Grade points are computed by multiplying the number of credits for a course (typically 1-3) by the grade (in the standard 4.0 scale) for the course. Grade points, rather than grade point average, were used as an indicator of curriculum experience, since they combine both the number of credits taken with the quality of performance in the courses.

Course Experience and Performance in Goal Areas: Grade points for each of the 6 general education goal areas were considered separately. These were computed for each student by the procedure outlined above. These scores were used in analyses which examined the goal areas separately. Grade points for Q (quantitative) and W (writing) courses were also obtained.

Course Experience and Performance in Other Courses: Grade points for all non-General Education courses were also computed. This variable indicates both the extent and quality of the student's academic experience with courses outside the general education curriculum.

Differences Between Freshmen and Upper Division Students

- Upper division students had significantly higher high school SAT Verbal (503 vs. 472) and SAT Math (556 vs. 537) scores. This indicates selective attrition during the Freshman and Sophomore year of students who had lower math and verbal abilities when they entered the University. All comparisons of Freshmen and upper division student performance will include the effect of this attrition, unless statistical controls are used.

- Averaging across all general education areas, upper division students scored significantly higher than did Freshmen (Overall mean = 53% for upper division students versus 45% for Freshmen). This difference includes effects of attrition of poorer students, growing maturity, general curriculum effects, as well as the effects of the general education curriculum.

- The better performance of upper division students appeared in all general education areas except Philosophy and Ethical Analysis, and a majority of the goals in each area showed significant improvements:

GEN. ED. AREA	Freshmen	Upper Div.	% Goals with Improvement
Science and Technology	42%	53%	100%
Philosophy and Ethical Analysis (Difference not statistically significant)	47%	51%	64%
Social Science and Comparative Analysis	56%	71%	92%
Foreign Languages	46%	51%	63%
Culture and Modern Society	28%	31%	50%
Literature and the Arts	50%	62%	100%

Effects of the Total General Education Curriculum

The first step in a more detailed examination of the effects of the General Education curriculum is to separate the effects of students' initial abilities, selective attrition, maturity, and performance in non-General Education courses from the General Education curriculum effects. To do this, simultaneous regression models, which include statistical controls for each of these factors, were constructed. In these models, the effects of each of the individual factors are separated from the effects of the other factors, so we can see the independent effects of each factor, with the influence of all other factors removed. The dependent variable in these models was the standard score for the General Education Assessment Instrument, computed using the overall mean and standard deviation for that instrument.

- Across all general education areas, for all students (Freshmen and upper division) the best predictor of performance (beta = .26) was the SAT Verbal score. The SAT Math score did not predict performance. This may reflect the fact that many of the general education test instruments required high levels of verbal processing. It might also indicate that general verbal abilities are critical to performance of the tasks associated with general education outcomes.

- The second best predictor was the grade points earned in all areas of the general education curriculum (beta = .17). This is clear evidence for the positive association of the General Education curriculum with performance on the assessment instruments, independent of students' SAT score differences, selective attrition, differences in general maturity, and performance in other parts of the curriculum.

- The third best predictor was performance in other, non-general education courses (beta = .14). This indicates some relationship between performance in the general curriculum and student performance on the assessment instruments, even when initial abilities, maturity, and general education curriculum effects are held constant.

- Q-course experience and performance (grade points) were significant predictors of performance on the assessment instruments, independent of the effects of all other General Education courses; W-course experience and performance were not predictive. This could be the result of the quantitative nature of some performance items in the science and technology and social sciences areas.

- No effects of maturity or university experience, as indicated by semester standing, were detected. The curriculum effects seen above are unlikely to be simple maturation effects.

Curriculum Effects Within Each Goal Area

Student performance was also examined within each of the six General Education groups in separate analyses. The same regression models used above were applied to each of the six general education groups. SAT scores, semester standing (maturity), and grade points for courses within the General Education group were used to predict the student performance on the General Education Assessment Instrument for that General Education group.

- Experience and performance in the General Education curriculum in a specific group was a significant predictor of performance only for the areas of Foreign Languages and Science and Technology.

- Coupling this finding with the generally positive results shown by the total General Education curriculum, when courses in all groups were considered as a whole, we conclude that the effects of the General Education curriculum appear to cut across the six boundaries of the University of Connecticut General Education course groupings. Academic performance in courses in one General Education group frequently predicted test performance levels in other groups. The General Education groupings appear to be artificial, and the general education curriculum is better seen as a

single entity, rather than as six separate groups of courses.

- For Foreign Languages, the amount high school experience in foreign languages was a very strong predictor of performance on the General Education Assessment Instruments for incoming Freshmen, as expected. However, this effect did not persist. For upper division students, the amount of high school language taken did not predict performance at a significant level (beta = .05), while the University course experience and performance (grade points) in foreign languages courses was a strong and significant predictor (beta = .24).

Individual Goals

Goals within each general education group were examined by using standardized goal scores. The following goals showed significant positive effects due to the General Education curriculum, when all other factors (initial abilities, attrition, maturity, and academic experience and performance outside General Education courses) were statistically controlled:

FOREIGN LANGUAGE

- In the modern languages, acquire an active vocabulary of approximately 1,500 lexical units and passive recognition of approximately 3,000 more.
- In the modern languages, achieve balanced development of speaking, listening, reading and writing skills at the novice level ("novice" level means ability to communicate on simple, concrete topics and includes a high frequency of grammatical and semantic inaccuracies).
- Acquire an inclusive perspective on the target culture(s), one which ranges from artistic accomplishments to details of everyday life.
- Understand the concept of ethnocentrism and be able to identify its impact on the student's own views and behavior.
- Understand the interaction between the foreign culture and the student's own in such areas as literature, art, music, philosophy, history and the sciences.

LITERATURE AND THE ARTS

- View literature and the arts as integral to all of human life and society, and not merely as the special interest of artists or an elite few.

CULTURE AND MODERN SOCIETY

- Have an inclusive perspective on the cultures and societies studied, recognizing not only accomplishments of elites but the skills and contributions of all classes and social groups.
- Compare specific characteristics (e.g. professions, institutions) of Euroamerican societies with those same characteristics in other societies.

PHILOSOPHY AND ETHICAL ANALYSIS

- No significant effect of the General Education curriculum was obtained for any of the goals in this area.

SOCIAL SCIENCES AND COMPARATIVE ANALYSIS

- Evaluate Western social science theories and perspectives about human behavior through comparative analysis.

SCIENCE AND TECHNOLOGY

- Interpret numerical information, predict future outcomes based on numerical data, generalize from numerical and statistical data, solve numerical problems.
- Give examples of basic facts and theories of one discipline, distinguish basic science from technological implications, deduce information from scientific and technical facts.

Since some goals had only a few associated General Education Assessment Instrument items (a few goals had no items at all, and so could not

be included in the statistical tests), and since the test items were sometimes only loosely related to the associated goal, the above tests of individual goals should be cautiously interpreted. In particular, lack of significant curriculum effects does not provide sufficient evidence to conclude that the particular goal is *not* being met. Nonsignificant results may be due to the particular Assessment Instrument items used, rather than to the curriculum. However, goals which showed nonsignificant curriculum effects should be closely inspected to determine the likely reason for the lack of relationship between students' curriculum and performance on goal test items.

Implications of the Results

- The existing general education curriculum has clear positive effects on student performance on the General Education Assessment Instruments.
- Curriculum effects are not isolated within General Education course groupings. Courses taken in one area affect performance in other areas.
- While most general education goals show improvement between University entry and the Upper Division, much of this improvement can be attributed to selective attrition of students who had poorer math and verbal abilities when they entered the University. Fewer of the goals show significant improvement due to the curriculum when the effects of attrition are controlled. However, many goals show clear effects of the General Education curriculum, even when controls for attrition and maturity are applied.
- The General Education goals, curriculum, and Assessment Instruments should be examined in light of these results. In particular, the following actions seem warranted:

1) *Expansion of the general education goals to include more specific and concrete outcomes which are to be expected from the general education curriculum.*

2) *Revision of the General Education Assessment Instruments to reflect these concrete outcomes and to reflect the fact that general education outcomes cut across goal area boundaries. This will improve the validity of the test instruments, remove some redundancy in the instruments, and give more definitive tests of goal achievement. Test instruments should be collapsed across goal areas to provide simpler, but still comprehensive instrument s, rather than six goal area tests.*

3) *Development of course revisions and/or new courses to address goals which show no effect of the General Education curriculum, providing that this lack of effect cannot be attributed to deficiencies in the General Education Assessment Instruments.*

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